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THESIS

UNDERSTANDING CHINA'S NUCLEAR NON-PROLIFERATION POLICY

by

Patti J. Nichols

June 1999

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China's nuclear-export activities appear to contradict its official non-proliferation policy. Scrutiny of China's nuclear exports and non-proliferation commitments indicate an adherence to strict "letter-of-the-law" obligations. Yet, China's commitment to the norms and values of the non-proliferation regime is controversial. The difference between China's legal obligations and the international norms of acceptable export behavior is a function of the ambiguity inherent in international treaties and agreements. Stephen Meyer's motivational hypothesis is used to evaluate China's nuclear-export decision-making process. China's motivational profile created by the combination of 16 incentives and disincentives on one hand, and international and domestic conditions on the other. Two case studies are used to illustrate that this profile is not static. As environmental conditions and China's national priorities change, so does China's motivational profile. In the past, U. S. attempts to alter China's nuclear-export activities were successful when the targeted changes were congruent with China's national priorities. For the United States to influence China's future nuclear-export activities, it must first understand China's national priorities and determine the corresponding export motivations that influence China's decision-making process. The United States should then work to change conditions, which would shift the balance of incentives and disincentives, thereby changing the outcome of China's cost-benefit calculus.

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UNDERSTANDING CHINA'S NUCLEAR NON-PROLIFERATION POLICY

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ABSTRACT

China's nuclear-export activities appear to contradict its official non-proliferation policy. Scrutiny of China's nuclear exports and non-proliferation commitments indicate an adherence to strict "letter-of-the-law" obligations. Yet, China's commitment to the norms and values of the non-proliferation regime is controversial. The difference between China's legal obligations and the international norms of acceptable export behavior is a function of the ambiguity inherent in international treaties and agreements. Stephen Meyer's motivational hypothesis is used to evaluate China's nuclear-export decision-making process. China's motivational profile created by the combination of 16 incentives and disincentives on one hand, and international and domestic conditions on the other. Two case studies are used to illustrate that this profile is not static. As environmental conditions and China's national priorities change, so does China's motivational profile. In the past, U. S. attempts to alter China's nuclear-export activities were successful when the targeted changes were congruent with China's national priorities. For the United States to influence China's future nuclear-export activities, it must first understand China's national priorities and determine the corresponding export motivations that influence China's decision-making process. The United States should then work to change conditions, which would shift the balance of incentives and disincentives, thereby changing the outcome of China's cost-benefit calculus.

TABLE OF CONTENTS

I. INTRODUCTION 1

A. RELEVANCE 1
B. METHODOLOGY 2
C. POLICY EVOLUTION 4
D. CURRENT POLICY 9
E. PROLIFERATION: DEFINED 10
F. CONCLUSION 14

II. NUCLEAR PROLIFERATION THEORY 17

A. INTRODUCTION 17
B. TECHNICAL IMPERATIVE HYPOTHESIS 18
C. MOTIVATIONAL HYPOTHESIS 20
D. SUI GENERIS WORLD HYPOTHESIS 22
E. EXPORT INCENTIVES 23
F. EXPORT DISINCENTIVES 31
G. CASE STUDIES 34
H. CONCLUSION 40

III. NON-PROLIFERATION COMMITMENTS 43

A. INTRODUCTION 43
B. INTERNATIONAL ATOMIC ENERGY AGENCY 44
C. NUCLEAR-WEAPON-FREE ZONE 50
D. 1985 U.S.-CHINA NUCLEAR COOPERATION AGREEMENT 52
E. NUCLEAR NON-PROLIFERATION TREATY 54
F. MISSILE AND TECHNOLOGY CONTROL REGIME 59
G. SINO-SOVIET NO-FIRST-USE AGREEMENT 61
H. MAY 1996 PLEDGE 62
I. ZANGGER COMMITTEE 63
J. NUCLEAR SUPPLIERS GROUP 65
K. CONCLUSION 67

IV. NUCLEAR EXPORTS 77

A. INTRODUCTION 77
B. EXPORTS PRIOR TO 1984 79
C. EXPORTS: 1984-1992 82
D. MTCR EXPORTS 86
E. EXPORTS: 1993-1997 87
F. POSSIBLE VIOLATION 90
G. CONCLUSION 95

V. CONCLUSIONS 99

A. ADAPTIVE PARTICIPATION 99
B. COSTS VS. BENEFITS 99
C. GUITLY OF PROLIFERATION? 100
D. REGIME AND U.S. POLICY IMPLICATIONS 101

BIBLIOGRAPHY 103

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EXECUTIVE SUMMARY

Since 1984, China has become increasingly involved in the international nuclear non-proliferation regime. This increased participation is compatible with China's official non-proliferation policy. However, China continues to make "proliferation-questionable" exports. "Proliferation-questionable" exports include dual-use materials and technology sold to states with suspected nuclear weapons-development programs. These exports violate the norms of acceptable export behavior because of China's possible intent to proliferate. China insists such exports are for peaceful purposes however, they raise questions among non-proliferation regime members concerning China's possible foreknowledge of the use of the exports in suspected weapons programs. This thesis explores the questions of what motivates China to participate in the non-proliferation regime, whether China's exports have violated its non-proliferation obligations, and what motivates China to continue "proliferation-questionable" exportation.

China has committed itself to the following non-proliferation obligations: to report all nuclear exports to the International Atomic Energy Agency (IAEA); to apply limited-scope safeguards to all items controlled by the Zangger Committee trigger list and the original Nuclear Suppliers Group trigger list; and to restrict assistance to those facilities under IAEA safeguards. The decision process by which China undertook these obligations was a type of cost-benefit calculus, which led China to make incremental adaptations to its non-proliferation policy. These changes in policy were reactions to internal and external factors.

Some of China's non-proliferation commitments such as a pledge to adhere to the Missile and Technology Control Regime and China's May 1996 pledge, are the direct

results of pressure from the United States. These commitments were made in order to remove obstacles (U.S. sanctions) preventing China from attaining its economic and political goals. All of China's commitments, however, have benefits that are perceived as outweighing the costs of participation. Although there have been changes in China's nuclear-export behavior, there is no evidence that these changes are due to any shift in the central paradigm of Chinese decision-makers, who maintain their *realpolitik* worldview. The difference is that participation in the regime is now viewed as a necessary means of attaining the goals established by China's national priorities.

China does not assume its non-proliferation obligations lightly. Although China has accepted the principle of non-proliferation, it places great importance on the sovereign right of all states to the peaceful use of nuclear energy. China contends non-proliferation should not impinge on states' sovereignty.

Many of China's exports are suspected of contributing to nuclear-weapons development programs. Dual-use materials and technology complicate the problem of separating belligerent from peaceful use. The U.S. has been the leading plaintiff against China's nuclear-export activities. Although the United States protests China's nuclear exports on the basis of what is exported, it appears that the protests depend on the identity of the recipient country and serve as a barometer of U.S.-Chinese relations.

Scrutiny of China's nuclear exports shows that China has adhered to a strict "letter-of-the-law" interpretation of its commitments. Under China's interpretation of the ambiguous guidelines of the applicable international treaties and agreements, its nuclear exports are legally acceptable. A U.S. nuclear watchdog organization, the Arms Control and Disarmament Agency, has concluded exactly this in its annual reports.

China's nuclear exports however, do violate the spirit of the non-proliferation regime, which is embodied in the norms of acceptable export behavior. China does not consider norms legally binding since it has not specifically agreed to adhere to them. China's decision-makers are of the opinion that a state's sovereign rights cannot be compromised by international consensus without the consent of the state in question. The peaceful use of nuclear energy and nuclear exportation are two of these sovereign rights. At best, China's nuclear-export behavior is characterized by "proliferation-questionable" exports that may provide indirect assistance to weapons-development programs. At worst, it is knowledgeable, direct assistance made within the legal framework of China's non-proliferation obligations.

Three general classes of nuclear proliferation-related hypotheses are used to evaluate why China continues "proliferation-questionable" exportation: a technological imperative, a *sui generis* world, and Stephen Meyer's motivational hypothesis. Meyer's motivational hypothesis is the most compelling of the three, providing a multi-level explanation for China's nuclear-export activities. It identifies 13 incentives and three disincentives influencing nuclear-export decision-making. China's national priorities, as well as internal and external conditions determine the combination of incentives and disincentives that make up China's motivational profile. The profile is not static; it changes as conditions and national priorities change. Therefore, different exports are made for different reasons. This is demonstrated in two case studies of Chinese nuclear exports to Pakistan and Iran.

Just as China's national priorities and the international environment are not static, the nature of the non-proliferation regime is also changing. As regulations proved

ineffective, the rules of acceptable nuclear export behavior have become more restrictive. China's "proliferation-questionable" exports have influenced the regime to develop stricter guidelines and made China a victim of "shifting goalposts." The changing nature of the regime has placed greater expectations on China to abide by the norms and not just the strict "letter-of-the-law" obligations. The changing nature of the regime influences China's non-proliferation policy, acting as a disincentive, which in turn influences China's nuclear-export decision-making.

In the past, U. S. attempts to alter China's nuclear-export activities were successful when the targeted changes were congruent with China's national priorities. For the United States to influence China's future nuclear-export activities, it must first understand China's national priorities and determine the corresponding export motivations that influence China's decision-making process. The United States should then work to change the conditions that would shift the balance of incentives and disincentives, thereby changing the outcome of China's cost-benefit calculus.

I. INTRODUCTION

A. RELEVANCE

The objectives of the United States National Security Strategy are as follows: 1) to enhance U.S. security; 2) to bolster U.S. prosperity; and 3) to promote peace and democracy around the world. Threats posed by weapons of mass destruction are considered detrimental to U.S. and global security. The United States is particularly concerned with technologies and destructive capabilities possessed by individuals or nations considered hostile to American and global security interests.[1] The proliferation of nuclear weapons is an increasing concern to the United States; therefore, stemming and countering the proliferation of these weapons are high strategic priorities for the United States.

The development and support of global norms that prevent the proliferation of nuclear weapons are considered critical for maintaining international peace and security. For this reason, the United States supports arms-control efforts which attempt to convince other countries that their interests are best served by not acquiring nuclear weapons. In addition, the United States attempts to limit the ability of non-nuclear states to acquire nuclear material and technology that could be used to develop nuclear weapons.

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[1] Statement by the Press Secretary, 1998 National Security Strategy Report (New York: Office of the Press Secretary, October 30, 1998). Available Online: http://www.pub.whitehouse.gov/uri-res [01 Dec 1998].

Although these efforts are largely diplomatic, the United States supports the use of sanctions and other punitive actions.[2]

The People's Republic of China is a major supplier of nuclear materials and technology to developing countries, and the United States has placed a high priority on its non-proliferation dialogue with China. The United States is primarily concerned with China's proliferation of missile and dual-use technologies, particularly to those countries the United States considers unfriendly. As a means of achieving its security objectives, the United States is committed to bringing China's non-proliferation practices and regulations more in line with international norms.[3]

B. METHODOLOGY

The goal of this thesis is to consider whether China exports nuclear materials and technology, which could be used to produce nuclear weapons, in contradiction to its official non-proliferation policy, and if so, why. Therefore, China's nuclear non-proliferation policy is the dependent variable. Several independent variables, which may influence this policy will be examined. External variables include international norms, economic and political pressures from the United States, and strategic security interests in the Middle East and the Asian sub-continent. Internal variables include economic interests, lack of export controls, and China's strict interpretation of its non-proliferation obligations.

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[2] *The United States Security Strategy for the East-Asia Pacific Region 1998.* Available Online: http://www.defenselink.mil/pub/easr98 [01 Dec 1998].

[3] Ibid.

Chapter II examines general theories of nuclear proliferation. The independent variables are applied in the context of proliferation hypotheses to determine which hypotheses, if any, explain China's nuclear-export activities. Conclusions about China's motivational profile are used in two case studies to elucidate why China chooses to export nuclear materials and technology to Pakistan and Iran, two nations that pose proliferation concerns to the United States.

Chapter III examines the international non-proliferation regime, and China's participation in this regime. It also examines China's non-proliferation obligations as dictated by the Nuclear Non-Proliferation Treaty, as well as other multilateral and bilateral agreements to which China is a party. Moreover, this chapter will differentiate between the specific guidelines of the agreements and international non-proliferation norms based on the intent and purpose of the treaties and organizations.

Chapter IV looks at China's nuclear-export activity, with special emphasis on exports to Algeria, Iran, and Pakistan. Exports are examined to determine what was sold, when it was sold and to whom, and under what safeguard conditions the transfer was made. The export information is then compared to China's obligations for non-proliferation at the time of the sale in order to determine if a violation occurred. Finally, the chapter concludes with a discussion of how China interprets its non-proliferation obligations based on the evidence of its nuclear-export activities.

Conclusions about China's non-proliferation policy are discussed in the final chapter. Also included in this chapter is a discussion of how China's nuclear-export activities may have possible future implications for U.S. foreign policy in regards to China and international non-proliferation regime changes.

C. POLICY EVOLUTION

China's nuclear non-proliferation policy has evolved at an accelerated pace over the past three decades. The evolution of this policy can be divided into three time periods: 1949-1954, 1954-1984, and 1984 to the present. China's early policy championed the right of Third World countries to possess nuclear weapons.[4] Prior to 1963, China realized its political goals could not be achieved while the superpowers monopolized the world's nuclear weapons. The leadership of the People's Republic of China considered the superpowers' actions to be those of "self ordained nuclear overlords," who expected the rest of the world to act as "nuclear slaves."[5] China rationalized that it had to break the nuclear monopoly in order to escape the nuclear blackmail imposed by the superpowers, particularly the United States. If China were to be influential in the international arena it needed to be recognized as a significant if not an equal power. In order to break the nuclear monopoly, China developed three different strategies: encouraging total disarmament by all nations; supporting nuclear proliferation; and developing its own nuclear weapons. These three strategies were neither mutually exclusive nor individually implemented. [6]

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[4] Charles N. Van Doren, *The People's Republic of China as a Nuclear Supplier: Export Policy, Capabilities and Constraints* (Southhampton England: Program for Promoting Non-Proliferation, University of Southhampton, 1989), 1; Rodney W. Jones, *China and the Non-Proliferation Regime: Renegade or Communicant?* (Southhampton England: Program for Promoting Non-Proliferation, University of Southhampton, 1989), 18.

[5] Leo Yueh-Yun Liu, *China as a Nuclear Power in World Politics* (New York: Taplinger Publishing Company, 1972), 25.

[6] Ibid., 26.

In July 1963, China called for worldwide nuclear disarmament, the destruction of all existing nuclear weapons, and a complete ban on nuclear testing. China soon realized, however, that total disarmament was not feasible. As a result, prior to its first nuclear test, China integrated its second strategy of nuclear proliferation with its first strategy of complete disarmament. At this time, nuclear resources in China were too scarce for export, however, China openly advocated nuclear proliferation.[7] Both General Lui Ya-lou, Commander and Chief of the People's Liberation Army Air Force (1958), and Chen Yi, Vice-Premier (1960), stated that the spread of nuclear weapons to as many countries as possible was desirable because it would ultimately improve prospects for complete nuclear disarmament.[8] China's leadership, at the time, also argued the threat posed by nuclear weapons depended on who possessed them. If socialist countries possessed nuclear weapons the prospects for peace were improved, but the same prospects were damaged if imperialist countries possesed them.[9] Although not in a position to help other countries, China encouraged others to develop nuclear capabilities.

After China's first nuclear test in 1964, this policy began to change and China introduced a new precondition to its policy of nuclear disarmament. China proposed a no-first-use agreement, where those countries possessing nuclear weapons would promise not to use them unless subjected to a nuclear attack. China argued that no-first-use was a necessary precondition of the ultimate goal, "complete prohibition and thorough

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[7] Jones, *China and the Non-Proliferation Regime: Renegade or Communicant*, 18.

[8] Lui, *China as a Nuclear Power in World Politics*, 30.

[9] Ibid., 31.

destruction" of nuclear weapons.[10] After its first test moreover, China no longer supported a complete ban on nuclear tests, as such a ban would halt China's nuclear development program. China denounced the Partial Test Ban Treaty and the Nuclear Non-Proliferation Treaty as constituting a conspiracy designed to "consolidate the nuclear monopoly."[11] Additionally, China claimed the nuclear powers had no right to prevent others from developing nuclear weapons until they destroyed their own or committed to a no-first-use policy.[12]

China's third and most effective strategy for breaking the nuclear monopoly was to develop its own nuclear arsenal. China began its nuclear program in 1953, with the development of atomic energy for peaceful uses, but this quickly evolved into a weapons program. China conducted its first explosive nuclear test on 16 October 1964. China's fourth test on 27 October 1966 included the use of a guided-missile delivery vehicle. The sixth test was of a hydrogen bomb delivered by a Tu-16 bomber, on 17 June 1967. This timeline illustrates the fast pace at which China's weapons development program proceeded.[13]

As China's nuclear-weapons program progressed, its policy towards proliferation changed. Prior to its first nuclear test, China had advocated an Asian nuclear-weapon-free zone. In November 1964, one month after its first nuclear-test explosion, China

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[10] Ibid., 27-28.

[11] *Nonproliferation Treaty (NPT)*, Center for Non-Proliferation Studies (CNS) Database, Monterey Institute for International Studies (MIIS). Available Online: http://cns.miis.edu/db/china/nptorg.htm [19 Nov 1998]; Lui, *China as a Nuclear Power in World Politics*, 29.

[12] *NPT - Related Statements and Developments*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nptchr.htm [10 Nov 1998].

[13] Lui, *China as a Nuclear Power in World Politics*, 33-37.

questioned the usefulness of such a zone, arguing a nuclear weapon free zone would deprive non-nuclear countries of their legitimate right to develop nuclear weapons. After its sixth test, China claimed to have broken the superpower nuclear monopoly.[14]

In the early 1980's, the Chinese government reduced funding to its nuclear industry and changed the industry's focus from national defense to improvement of the domestic economy. The Chinese leadership also decided to improve the quality of China's nuclear weapons rather than increase the quantity. These changes created a need for foreign currency and technology. China then reversed its policy of prohibiting the export of nuclear-related products in order to generate the hard currency necessary to purchase western technology and to support the development of its economy and civilian nuclear industry. In doing this, China saw the benefits of free-riding on the arms-control agreements that restricted other states. Several of these initial exports, particularly those conducted prior to 1984, are considered damaging to international non-proliferation goals.[15] The majority of these transactions were unsafeguarded exports of heavy water.

Although China's position on nuclear non-proliferation began to change in the 1980's, it remained critical of the Nuclear Non-Proliferation Treaty. China viewed the treaty as discriminatory, but in 1982 announced acceptance of the principle of non-proliferation. It viewed non-proliferation as the means to the end of "complete

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[14] Ibid., 65, 77-78.

[15] *China's Nuclear Exports*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nexport.htm [21 Nov 1998]; Banning N. Garrett and Bonnie S. Glaser, "Chinese Perspectives on Nuclear Arms Control," *International Security* 20, no. 3 (winter 1995): 47; Van Doren, *The People's Republic of China as a Nuclear Supplier: Export Policy, Capabilities and Constraints*, 1.

prohibition and thorough destruction" of nuclear weapons.[16] Being critical of the established international non-proliferation regime, China emphasized no-first-use pledges and negative security assurances, as well as bilateral agreements.[17]

The year 1984 marked a turning point in China's nuclear non-proliferation policy when it joined the International Atomic Energy Agency (IAEA) and agreed to apply IAEA safeguards to all of its nuclear exports.[18] At this time, China's policy towards non-proliferation changed significantly. Following entry into the IAEA, Chinese Premier Zhao Zyang announced China's official nuclear non-proliferation policy: "We do not engage in nuclear proliferation ourselves, nor do we help other countries to develop nuclear weapons."[19]

Following IAEA membership, China also entered into nuclear cooperation agreements with 14 countries and supported nuclear-weapon-free zones in the South Pacific and Africa. China insisted that its nuclear cooperation agreements were exclusively for peaceful purposes. Former Chinese Foreign Minister, Qian Qichen (1989)

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[16] Van Doren, *The People's Republic of China as a Nuclear Supplier: Export Policy, Capabilities and Constraints*, 5; *Nonproliferation Treaty (NPT)*, CNS Database, MIIS [19 Nov 1998]. *NPT - Related Statements and Developments*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nptchr.htm [21 Nov 1998].

[17] A no-first-use declaration is a confidence-building measure in which a nuclear-weapon state promises not to use nuclear weapons first. A negative security assurance is a declaration that a nuclear-weapon state will not use nuclear weapons against a non-nuclear-weapon state. It is intended to reassure non-nuclear-weapon states.

[18] Yan Kong, *A Wild Card: Chinese Heavy Water Exports*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/archives/nuc/eos/yankong.htm [01 Dec 1998].

[19] Van Doren, *The People's Republic of China as a Nuclear Supplier: Export Policy, Capabilities and Constraints*, 5; *International Atomic Energy Agency (IAEA)*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/iaeaorg.htm [21 Nov 1998].

stated, "China does not advocate, or encourage, or engage in nuclear proliferation, and will only cooperate with other countries in the peaceful application of nuclear energy."[20]

D. CURRENT POLICY

China's next major non-proliferation policy step occurred in 1992, when it formally acceded to the Nuclear Non-Proliferation Treaty (NPT). In that year, China also agreed to adhere to the Missile Technology Control Regime (MTCR). China joined the Zangger Committee (ZAC) in 1997 but declined to join the Nuclear Suppliers Group (NSG). China has agreed, however, to adhere in principle to the NSG trigger list.[21] China's participation in the international nuclear non-proliferation regime is due, at least in part, to political and economic pressure from the United States. China needs western technology to develop its civil nuclear-energy program, and the United States is prepared to provide assistance in exchange for compliance to international guidelines and regulations.

Since 1963, China has consistently called for the "complete prohibition and thorough destruction of nuclear weapons." China's current policy maintains that nuclear non-proliferation is an intermediate step towards this ultimate goal. This policy is more in accord with the international nuclear non-proliferation regime, which China has joined. Indeed, China's current non-proliferation policy supports the three objectives of the NPT: 1) prevention of the proliferation of nuclear weapons, 2) the promotion of nuclear

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[20] *NPT - Related Statements and Developments*, CNS Database, MIIS [10 Nov 1998].

[21] A trigger list is a list of materials and components that require IAEA safeguards for export. *China and International Agreements, Organizations, and Regimes*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/regimes.htm [19 Nov 1998].

disarmament, and 3) the enhancement of international cooperation for the peaceful uses of nuclear energy. Although China's policy is not to endorse, encourage, or engage in the proliferation of nuclear weapons, it fully supports assisting developing countries in the peaceful uses of nuclear energy. Although China once claimed that the possession of nuclear weapons was the right of every state, it now holds that only the peaceful use of nuclear energy is the inalienable right of all states.

Consequently, China continues to export nuclear materials and technologies to developing countries. Currently, China says the following three principles govern its nuclear exports: 1) exports are exclusively for peaceful purposes, 2) exports must be subject to IAEA safeguards, and 3) exports cannot be retransfered to a third country without China's consent. In order to enforce these principles, China has instituted a new system of export controls.[22]

E. PROLIFERATION: DEFINED

In order to determine if China's nuclear-export activities constitute "nuclear proliferation," it is necessary first to define proliferation and the internationally accepted norms and regulations that govern such activities. Proliferation has two components, the action taken and the items affected by that action. The NPT is an example of this.

The NPT was designed to prevent the proliferation of nuclear weapons. In order to accomplish this, Article I of the NPT prohibits the transfer of "nuclear weapons or

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[22] *National Report of the People's Republic of China on the Implementation of the Treaty on the Non-Proliferation of Nuclear Weapons*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/engdocs/npt0495.htm [01 Dec 1998].

nuclear explosive devices," and the transfer of control of such weapons or devices to any recipient, by any Nuclear-Weapon State Party. Article II prohibits any Non-Nuclear-Weapon State Party from receiving or taking control of "nuclear weapons or nuclear explosive devices." Article III obligates NPT parties to apply International Atomic Energy Agency (IAEA) safeguards to all "source or special fissionable material" and "equipment or material especially designed or prepared for the processing, use or production of special fissionable material." The Treaty prohibits the transfer of these items to Non-Nuclear-Weapon States without IAEA safeguards.[23] Thus, the conclusion may be drawn that the NPT defines proliferation as the physical transfer or (transfer of control) of source or fissionable material or equipment (or material especially designed or prepared for the processing, use, or production of special fissionable material) from a Nuclear Weapon State Party to a Non-Nuclear Weapon State Party, without the application of IAEA safeguards.

Although this may seem to be a comprehensive definition, there are some limitations to its application. The concept of source and special fissionable material is well understood by the nuclear community, but the NPT is not clear about what specific equipment or material is considered "especially designed or prepared" for nuclear purposes. Additionally, the NPT does not address intangibles, such as nuclear technologies, knowledge, or dual-use items. Dual-use items are those "which could be, if used for purposes other than those for which the export is intended, of significance for

[23] *Nonproliferation Treaty (NPT)*, CNS Database, MIIS [19 Nov 1998].

nuclear explosive purposes."[24] The NPT is also limited in that it applies only to those states that are party to the Treaty, and requires less stringent safeguards for exports to non-NPT states. Additionally, the IAEA applies separate safeguards to nuclear- and non-nuclear-weapon states. This is often presented as an argument for not acceding to the NPT.[25]

In order to clarify the obligations set forth in the NPT, two non-proliferation organizations were established. The first was the Zangger Committee, founded in 1971. The objective of the Zangger Committee was to interpret the NPT's requirements for safeguards on exports of nuclear equipment and materials. In doing this, the Committee developed a trigger list of specific nuclear equipment and materials that must be safeguarded for export.

The second non-proliferation group, the London Nuclear Suppliers Group (NSG) was formed in 1975, when events indicated the NPT was not curbing the proliferation of sensitive nuclear technologies. The NSG was created primarily to accommodate France, which could not participate in the Zangger Committee because it had not ratified the NPT.[26] The NSG adopted the Zangger trigger list and added heavy water and heavy-water production plants to its control list. In 1992, the NSG added 65 dual-use items to

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[24] Burrus M. Carnahan, *Export Law and Policy of the Emerging Nuclear Suppliers: A Basis for Cautious Optimism*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/archives/nuc/eos/carnahan.htm [01 Dec 1998].

[25] Carnahan, *Export Law and Policy of the Emerging Nuclear Suppliers; Discrimination Under the NPT*. Available Online: http://axil.whatswhat.com/nuke/html/npt_discrim.html [18 Nov 1998].

[26] Ibid.

the export-control list and adopted the policy of applying full-scope IAEA safeguards to all new export contracts.[27]

The international norms governing nuclear non-proliferation are those guidelines and regulations concerning nuclear transfers and exports that are accepted by the majority of nuclear supplier states, which traditionally govern their own activities. The NPT, which facilitates the application of IAEA safeguards, combined with the guidelines established by the Zangger Committee and the NSG traditionally governs these export activities.

Therefore, for the purposes of this thesis, all of the following are considered international non-proliferation norms: the IAEA safeguards, the Zangger and NSG trigger lists, and the guidelines set forth in the NPT. The nuclear suppliers consider these norms binding upon all who export nuclear materials and technology. China has not accepted all of the obligations set forth by these non-proliferation norms, however, and considers them only a guide for acceptable behavior to those who formally accede to the corresponding treaties and agreements. Although the United States considers all nuclear supplier states bound by all norms of the non-proliferation regime, China does not consider itself bound by the obligations of those agreements to which it has not formally acceded.

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[27] *Zangger Group and Nuclear Suppliers Group*. Available Online: http://www.nuke-energy.com/html/zangger_group.htm [18 Nov 1998].

F. CONCLUSION

China has been a nuclear supplier state since the early 1980's when it began exporting heavy water. These exports were not safeguarded until 1984 when China became a member of the IAEA. The following chapters will show that China's nuclear exports activities have adhered to the specific requirements of its non-proliferation obligations. China's non-proliferation obligations are those norms China considers binding.

In certain instances however, China has violated the spirit or intent of the regime by not adhering to the norms as they exist today that govern the export activities of other major nuclear suppliers. Although China's nuclear transfers have adhered to the regulations governing acceptable behavior for the treaties and agreements to which China has formally acceded, they have not adhered to the norms set forth by the agreements to which China has not acceded. China's export activities are based on its interpretation of its non-proliferation obligations, and are damaging to the effectiveness of the international non-proliferation regime.

China insists all its nuclear exports including dual-use materials are for peaceful purposes. In fact, China's policy requires a pledge from recipient states that the export will be used only for peaceful purposes. China considers itself under no obligation, however, to enforce this agreement once the transaction has been made. China may not be intentionally providing direct assistance to thew nuclear-weapons programs of other states but it is intentionally disregarding the possibility that its exports might be providing

indirect assistance due to both a lack of policy enforcement and China's seeming disregard of the nuclear weapons programs of Non-Nuclear Weapon States.

China did not accede to the NPT until 1992, and only joined the Zangger Committee five years later. This thesis intends to show that China's late participation in the international nuclear non-proliferation regime left Chinese officials not only unfamiliar with international non-proliferation norms, but also unaware of the legal infrastructure necessary to control their nuclear exports. The changes in China's nuclear non-proliferation policy have been a series of tactical adaptations to protect China's national interests and enhance its relative security, with no real change in its *realpolitik* perspective of international environment. In essence, China is not as far along the non-proliferation learning curve as other participants in the international non-proliferation regime. This gap is further complicated by the controversy concerning dual-use material and technology on one hand and the peaceful use of nuclear energy on the other.[28]

[28] Kong, *A Wild Card: Chinese Heavy Water Exports*, CNS Database, MIIS [01 Dec 1998].

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II. NUCLEAR PROLIFERATION THEORY

A. INTRODUCTION

The nuclear materials and technology exported by one country may or may not assist another country's undeclared nuclear-weapons development program. Furthermore, although the nuclear supplier may not intend to assist in the development of nuclear weapons, the possibility exists for the technology to be diverted to such a program. When considering why China exports nuclear materials and technology, one must assume that the decision to export can be made independently of the decision to assist in weapons development.[29]

The process of nuclear-export decision-making will serve as the subject of analysis in an attempt to determine what motivates China to export nuclear materials and technology.[30] Is there a pattern underlying the decision to export? Are nuclear exports the product of an intentional effort to assist another country to develop nuclear weapons or are they the by-product of industrial and economic development?[31]

There are numerous nuclear-proliferation hypotheses concerning why nations seek to develop nuclear weapons. Given the relative scarcity of similar theoretical studies concerning why nations choose to export nuclear materials and technology, existing

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[29] Stephen M. Meyer, *The Dynamics of Nuclear Proliferation* (Chicago: University of Chicago Press, 1984) 5.

[30] For the purposes of this thesis, nuclear-export decision-making refers to the process by which a nation decides to export or not to export nuclear materials, technology, or expertise.

[31] Meyer, *The Dynamics of Nuclear Proliferation*, 5, 9.

nuclear-proliferation hypotheses will be modified and applied to the question of nuclear exports to determine if any conclusions can be drawn about China's nuclear-export decision-making. There are three general classes of hypotheses concerning nuclear decision-making: technical imperative hypotheses, motivational hypotheses, and *sui generis* world hypotheses. In the following section each of these will be described in turn.

B. TECHNICAL IMPERATIVE HYPOTHESES

The first class of hypotheses posits that nuclear technology itself is the driving force behind nuclear-export decision-making. In this sense, there is a technological imperative that inevitably drives a country to export nuclear materials and technology once it has the capability to do so. The deterministic nature of these hypotheses is based on the following working premises: 1) for all nations there is a continuous national effort to improve the level of economic development and as a result, the underlying industrial and technological capability of the nation will progress; 2) Once nuclear exports become technologically and industrially feasible, the sheer momentum of progress will compel the nation to export, in order to support its domestic program in other words, the domestic market is not sufficient to support the continued development and maintenance of the nuclear infrastructure; and 3) eventually, all nations with the technological means will export nuclear materials and technology. According to these hypotheses, the only determining factor in the nuclear export decision-making process is technology.[32]

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[32] Meyer, *The Dynamics of Nuclear Proliferation*, 9-10.

There are variations to the general trend of these hypotheses. The first variation states that, although some nations may take longer to respond to the technological imperative, eventually all will succumb. This implies that nuclear-export decisions are not systematically distributed across time. The decision to export, will nevertheless inevitably follow the latent capacity to do so. A second variation states that, the more advanced the nuclear-related infrastructure within the country, the more likely it is to begin exporting. In this variation, the driving force of the technological imperative is directly proportional to the nation's resources and latent capacity to export. Rather than a random distribution of nuclear-export decision-making, there exists a systematic pattern tied to the level of development of the nation's nuclear infrastructure. This hypothesis seems to imply a technological tripwire that, once reached, would automatically trigger the decision to export.[33]

The technological imperative is not a compelling set of hypotheses. First, they preclude the need to give serious consideration to other domestic and international conditions, as well as other factors affecting nuclear export decision-making, that are not directly related to the national resource capacity. Second, when nations do not export as soon as they are technologically and industrially capable, the hypotheses fail to explain a separate motivation that would be required to trigger the decision to export. Finally, when nations decide to export at different stages in the development of their nuclear infrastructures, such developments tend to disprove the existence of a technological tripwire that triggers the decision to export. Rather, a lack of resources and technology acts as a limiting factor in nuclear-export decision-making. The latent technological and

[33] Ibid., 10-12.

industrial capacity to export is a necessary but alone is an insufficient condition to produce a decision to export.[34]

C. MOTIVATIONAL HYPOTHESIS

The second set of hypotheses suggests that the decision to export nuclear materials and technology is the result of the systematic effects of a discrete set of political and military variables. These variables exist at the system, unit, and individual levels. When the appropriate political-military considerations coalesce, the decision to export nuclear materials and technology is made. Nuclear exports are one option a nation may pursue in its efforts to accomplish foreign, defense, and domestic policy objectives.[35]

The motivational hypotheses involve an inherently probabilistic process. Decision-makers are not driven by an irresistible force, although technical capability is still a necessary condition; rather, they have a choice whether or not to export. Decisions to export are the result of two necessary conditions: latent technical and industrial capacity, and significant proliferation motivations.[36]

The motivational hypotheses make some basic assumptions about the decision-making process. First, nuclear-export decisions are reached by a single, discrete unit whose members share the same general worldview. Second, the decision unit exists within a defined set of conditions that may change over time. Third, decision-makers are able to perceive their situation and its manifest changes. Fourth, decision-makers react to

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[34] Ibid., 10, 12.

[35] Ibid., 9.

[36] Ibid., 13.

certain conditions or changes in conditions. Finally, there is a range of alternative responses available to the decision-makers.

The conditions or changes in conditions are decision stimuli, which can be internal or external to the decision unit and evoke the need for the unit to respond. Decision options are the range of responses that the decision-makers perceive as available. Nuclear-export decisions are distinct actions selected from the set of decision options based on the influences of the decision stimuli. The perceived blend of incentives and disincentives attached to each particular option determines the decision option chosen. In other words, the relative costs and benefits of each option are compared and weighed when making a nuclear-export decision. The relative strengths of the incentives for and disincentives against exporting nuclear materials and technology depend on the particular conditions manifest at the time the decision is made. These relative strengths are not fixed quantities; they vary across time and space.[37] Although the same incentives may operate across time and space, their influence on the decision unit's choices may vary as a function of the combined effects of other conditions. These conditions act as aids or constraints to export. While incentives and disincentives can be subjective, perceived cognitions associated with nuclear-export motivations, aids, and constraints are objective, tangible items that refer to technical capabilities. In the absence of motivational conditions, however, aids and constraints will not affect nuclear export decision-making, because both technical capability and significant motivations are necessary for export.[38]

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[37] Here, space refers to potential customer of Chinese nuclear exports.

Although there are several theories about how the decision-making process operates (rational actor, bureaucratic model, organizational model, etc.), the motivational models do not address this issue and are not isolated to a specific level of analysis. The motivational models postulate that certain motivational conditions are systematically related to the selection of specific decision options. Therefore, China's decision to export nuclear materials and technology should be systematically related to prevailing motivational conditions.[39]

D. *SUI GENERIS* WORLD HYPOTHESES

The third class of hypotheses is similar to the set of motivational hypotheses, recognizing that both political motivations and technology have roles to play. The *sui generis* world hypotheses incorporate the same variables as the motivational and technical imperative hypotheses, but weight them differently. According to the *sui generis* world hypotheses, particular individuals and events come together at specific times to create the right conditions for a certain nuclear-export decision to be made. Unlike the systematic pattern of the motivational hypotheses, the mix of variables is random and yields unpredictable results. Since a myriad of factors must coalesce for an instant that can never be repeated, each nuclear-export decision is unique and the necessary conditions are neither identifiable, nor predictable, nor consistent. Since this combination of conditions cannot be repeated, the *sui generis* world hypothesis cannot be used to

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[38] Meyer, *The Dynamics of Nuclear Proliferation*, 13-16.

[39] Ibid., 16.

determine positively any generalizable patterns among cases.[40] Furthermore, the technological imperative hypotheses are also insufficient for explaining nuclear-export dynamics, the motivational hypothesis will be the focus of this study.

E. EXPORT INCENTIVES

In order to answer the question of why China chooses to export nuclear materials and technology, it is necessary to identify the motivational incentives and disincentives that influence China's decision unit. These incentives fall into three categories: international political power/prestige incentives, military/security incentives, and domestic political incentives. A nation influenced by the first category of international political power/prestige incentives, exports nuclear materials and technology to enhance its status and position in the eyes of other nations. The extent to which nuclear exports actually do enhance a nation's international prestige may amount to less than the country believes is true. These types of incentives, however, are particularly influential for isolated nations or those nations on the political fringe of the international system. The second category, military/security incentives, influences those nations that wish to bolster military capabilities or increase security. With respect to nuclear exports, a nation may be influenced through military/security incentives to bolster the military capabilities of an ally or potential ally or of a nation strategically important to its own security. In the third category, domestic political incentives, the decision stimulus originates within the domestic context and nuclear exports are intended to affect internal conditions. The

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[40] Ibid., 9, 17-18.

effects of all motivational conditions, however, are filtered through the domestic political system before policy decisions are made. Therefore, all motivational conditions are in some way tied to domestic politics.[41]

Within these three categories, Meyer identifies 20 proliferation-related incentives. Thirteen of these can be adapted and applied to nuclear export activities. They are: 1) enhance regional power status, 2) improve global power status, 3) acquire a position in an international forum, 4) demonstrate national viability, 5) enhance a bargaining position within an alliance, 6) assert political-military independence, 7) redress conventional military asymmetry, 8) divert domestic attention, 9) reduce economic defense burden, 10) increase domestic moral, 11) enhance general international prestige, 12) demonstrate modernity, and 13) acquire economic and industrial benefits.[42]

1. Regional and Global Power Status

Regional power status recognizes a particular nation's pivotal role in political, military, and economic relations within the regional setting.[43] China rises above its neighbors both militarily and economically. It has the largest modern military in the region and has realized tremendous economic growth. Moreover, it wishes political recognition as a regional power. Its willingness to export nuclear materials and technology, particularly to those states to whom western nations refuse nuclear assistance,

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[41] Ibid., 44-46.

[42] For a complete list of proliferation-related incentives see Meyer, *The Dynamics of Nuclear Proliferation*, 48-49.

[43] Ibid., 50.

places China in the role of regional, nuclear benefactor. Developing countries in the region are dependent on China for nuclear technology.

Global power status reflects a nation's ability to systematically influence events outside of its own region. Global powers expect to be consulted on every issue of consequence. China wishes to be recognized as a global power. Prestige is an important concern for a nationalistic state such as China. During the Cold War, China's prestige was linked to its geopolitical significance. In the late 1980s, China's prestige was partly the result of its economic success. China bolstered its economic interests by free-riding on the NPT restrictions of others.[44]

Global power relationships are characteristically competitive and contentious. By virtue of their status, global powers are natural security threats to one another.[45] This characterization of global powers helps explain the tense relationship between China and the United States. All states seek to protect their own interests, which are not typically harmonious with the interest of other states. When two states attempt to advance their own interests in a global arena, competition and contention are the result. China has made no secret of its global-power aspirations. Nuclear exports provide China a means of influencing events outside of its region.[46]

2. National Viability

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[44] *The Proliferation Puzzle*, 219.

[45] Meyer, *The Dynamics of Nuclear Proliferation*, 51, 58.

[46] China's primary geologic focus for nuclear exports outside of its region has been the Middle East, with exports to Iran, Iraq, Algeria, and others.

The need to demonstrate national viability usually applies to those states on the political fringe of the international system. Nuclear exports provide a means of forcing the international community to "sit up and take notice." According to one theory, all states are classified as either core states or periphery states, bases on their relative position in the international structure. The core states have common concerns, which prompt them to enter into coalition agreements and alliances. Although the periphery states do not share the same values as the core states, they want to join the core in order to share in the benefits of international political and economic cooperation.[47]

Although China is a nuclear power and is a permanent member of the United Nations' Security Council, it has remained on the economic and political periphery of the international system. China does not appear to share the same values as western nations, particularly the values of the international non-proliferation regime, including the principle that the spread of nuclear weapons is detrimental to world peace and to the security of individual states. China's ambition to become a major power represents the desire of a periphery state to join the core. By becoming a nuclear supplier, China has increased its power and influence, not only with those states that receive China's nuclear exports, but also with those who seek China's participation in nonproliferation agreements. It may not have been China's original intent, but its nuclear exports have made it impossible for China to be ignored or isolated by the nonproliferation core.[48]

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[47] Ogilvie-White, "Is There a Theory of Nuclear Proliferation?" 49-50.

[48] This theory, however, has one obvious flaw; it does not explain China's decision to remain outside the nuclear non-proliferation regime for the first fifteen years of the regime's existence.

3. International Political Incentives

A state's desire to enhance its position within an alliance may act as a disincentive as well as an incentive. Although it may not have been China's original intention, its nuclear-export activity has increased the significance of its participation in the international non-proliferation regime. As a major nuclear supplier, China has the capability to undermine the regime. China's nuclear-export activities, however, also may cause other members of the regime to question China's commitment to the values of the regime.

Another incentive for China to export nuclear materials and technology is its desire to assert its political-military independence. In its competitive relationship with the United States, China does not want to be perceived by other countries as following the U.S. lead or being forced to bend to the will of the United States. Nuclear exports have provided China a means of asserting its sovereign right to chose what and to whom to export.

4. Military and Security Incentives

A primary goal of all states is security, which is influenced by external pressures of perceived threats from neighbors and other potential adversaries. Based upon this reasoning, states would proliferate only if it somehow contributed to their national security. Military/security incentives include deterring an attack on an ally from a nuclear-armed adversary and redressing a conventional military asymmetry between an ally and its adversary. These incentives influence nuclear-export decision-making when there is an explicit adversarial relationship between and ally and an adversary who is

known to possess nuclear weapons or have a significant conventional advantage. An explicit adversarial relationship exists when there has been a recent security dispute, such as the conflict between India and Pakistan.[49] China's desire not to be drawn into such a dispute in the future has influenced it to equalize the Indo-Pakistani adversarial relationship by exporting nuclear materials and technology to Pakistan.[50] Military/security incentives do not explain a state's proliferation activity when despite the possibility this activity might undermine security by destabilizing the global environment, states export nuclear material and technology.[51] For example, China's interests are not served by the possible acquisition of nuclear weapons by Taiwan and South Korea.[52]

5. Domestic Political and Economic Incentives

Domestic political incentives for exporting nuclear materials and technology include the following: 1) increasing domestic morale with a technological approach to "rallying around the flag;" 2) decreasing the economic defense burden; and 3) diverting international attention away from domestic issues.[53] It is possible China increases domestic nationalistic sentiment by asserting its sovereignty through nuclear exports. China's nuclear exports also divert international attention away from such domestic issues as human rights and political freedom, which could harm China's international

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[49] Meyer, *The Dynamics of Nuclear Proliferation*, 56.

[50] This relationship will be explored in more detail in the Pakistan case study.

[51] Ogilvie-White, "Is There a Theory of Nuclear Proliferation?" 45-46.

[52] Shao-Chuan Leng, "China's Nuclear Policy: An Overall View," 9.

[53] Meyer, *The Dynamics of Nuclear Proliferation*, 63, 65.

image. For the United States, it appears the international issue of nuclear non-proliferation takes precedence over issues internal to China. Finally, nuclear exports reduce China's defense burden.

China's nuclear exports are a manifestation of its national interests. In 1984, central Chinese authorities determined no major war would occur for the following 10-15 years. This made defense modernization a secondary priority to economic development. Subsequently, the State Council and Central Military Commission authorized, even encouraged the entire defense establishment, including China's nuclear industry, to engage in arms exports. These exports made the military sector more self-reliant in fund raising, relieving the nation of the burden of a huge defense expenditure. Even the political impacts of nuclear transfers were secondary to the procurement of hard currency in the 1980s.[54]

Nuclear exports have been a part of China's economic reforms, in its attempts to achieve economic strength. The fact that China chooses to export to developing nations, to whom western nations will not export increases China's influence with those countries. The export of nuclear materials and technology has provided China a means of achieving, in part, its objective of becoming a major power with the accompanying economic and political influence.

China's recent success in the market-oriented reform of the nation's economy has reduced the need to rely on nuclear exports for hard currency. This success is evident in its expanding civilian foreign trade and the conversion of defense industries to civilian

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[54] *The Proliferation of Advanced Weaponry: Technology, Motivations, and Responses*, 125-126.

production. Between 1990 and 1992, civilian trade increased 15 percent annually. In 1991, 54 percent of the state-owned nuclear industrial production was for civilian purposes, including power plants and medical technology. Economic success has helped change China's export behavior. China is not now as heavily reliant on arms sales or nuclear exports to earn hard currency.[55]

Because of this economic success, other national interests have come to the forefront of Chinese policy decision-making. China's national interests include its regional influence and its image among advanced nations as a responsible nuclear power balanced with its image as a champion of the interests of developing nations. These national interests have had significant influence over China's nuclear exports to Pakistan and Iran.

6. Universal Incentives

There are certain international proliferation-related incentives that are universal. These include enhancing general international prestige, demonstrating modernity, and benefiting from economic and industrial spin-offs. All nuclear capable countries can be expected to operate under the influence of these incentives at all times.[56] China's prestige is based on how it is perceived by other nations. Ownership of nuclear weapons did not bring China all the regional or international power, leverage, or prestige China had hoped to acquire. Nuclear weapons did not solidify China's leadership over the developing world. They did not provide the impetus to allow China to supplant Taiwan in the United

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[55] Ibid., 128-133.

[56] Meyer, *The Dynamics of Nuclear Proliferation*, 67.

Nations. Nuclear weapons did not give China greater regional influence when it lacked economic power during the Cultural Revolution and the Great Leap Forward.[57] China has turned to international trade, including the export of nuclear materials and technology, to obtain the economic and political power, prestige, and influence it seeks.

A final incentive that may influence China's nuclear-export activities is a general lack of concern about proliferation. Based on China's past proliferation policies and related statements, it is possible to infer that there exists a residual attitude among China's decision-makers for advocating the sovereign right of all states to develop nuclear weapons.[58]

F. EXPORT DISINCENTIVES

Proliferation-related disincentives are as influential as incentives. Meyer identifies ten export disincenitves, three of which can be adapted and applied to nuclear-export activity. These disincentives are international legal commitments, a peaceful reputation, and technical and industrial incapacity.[59]

1. International Legal Commitments

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[57] *The Proliferation Puzzle*, 233-234.

[58] *Quotations From Chairman Mao Tsetung* (Peking: Foreign Language Press, 1976) 82-87.

[59] For a complete list of proliferation-related disincentives see Meyer, *The Dynamics of Nuclear Proliferation*, 68.

When a country has assumed an international legal obligation not to proliferate, its decision to abrogate such an agreement could have severe repercussions. The diplomatic fallout of such a decision might include diplomatic protests, insinuations regarding intentions, and other strains on diplomatic relations. A state might also face economic, technical, military, and/or trade sanctions.

Since 1984, China has made several commitments to the international non-proliferation regime.[60] As these commitments do not prohibit all nuclear exports, their influence partially depends on how China perceives its non-proliferation obligations. The dissuasive potential of international legal commitments also derives from two other sources: 1) the underlying basis for having assumed the commitments and 2) ex post facto potential repercussions that would follow from abrogating the agreement.[61] Therefore, it is necessary to understand China's motivations for making its non-proliferation commitments.[62]

Yet another aspect of international legal commitments that can act as a disincentive is the concerted effort by one or more major powers to enforce a non-proliferation norm through active policing. U.S. domestic law has determined an acceptable standard of behavior concerning nuclear trade. The U.S. enforces this standard through diplomatic pressure, sanctions, and denial of nuclear cooperation.[63]

2. Peaceful Reputation

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[60] These commitments are outlined in Chapter II.

[61] Meyer, *The Dynamics of Nuclear Proliferation*, 69-70.

[62] China's motivations for joining the non-proliferation regime are discussed in Chapter II.

[63] The relevant U.S. laws are referenced in section D of Chapter II.

China has gone to considerable lengths to cultivate a militarily defensive, if not entirely peaceful reputation. China insists its nuclear arsenal is for defense only and has declared a no-first-use policy. China also insists its nuclear cooperation with other countries is strictly for peaceful purposes.[64] Any perception by the international community that "proliferation-questionable" exports are intended to assist nuclear weapons programs would undermine the behavior basis of the peaceful reputation China wishes to portray. Its desire for a peaceful reputation and a corresponding international image act to dissuade China from exporting nuclear materials and technology.[65]

3. Technological and Industrial Incapacity

Since technological and industrial capacity is necessary for the export of nuclear technology and materials, a nation's technological and industrial incapacity is, by definition, a disincentive. Limitations in skilled personnel and ability to indigenously produce the necessary component parts limit any potential nuclear supplier. If China cannot produce the necessary materials or component parts, it cannot export them. More specifically, if China cannot produce a surplus of these materials it will not export them.[66]

4. Motivational Profile

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[64] *NPT-Related Statements and Developments*, CNS Database MIIS [10 Nov 1998].

[65] Meyer, *The Dynamics of Nuclear Proliferation*, 72.

[66] This disincentive is further discussed in the Iran case study.

If the motivational hypotheses are correct the 13 incentives and three disincentives should be systematically related to a nation's decision to initiate or forego nuclear exports. There are several thousand possible combinations of these nuclear-export variables, which represent an equal number of motivational profiles. The complex situations in which several variables coalesce make determining a nation's motivational profile over an extended period of time extremely difficult. It may be possible, however, to determine a nation's motivational profile for a specific period of time by examining the combination of variables present. This combination is not static. When the international environment and/or a state's domestic situation changes, the combination of variables changes.[67] Specifically, as China's national priorities change its motivational profile changes. Two case studies will show how the combination of incentives and disincentives influencing China's nuclear-export decision-making change across time and space. They will also show the costs-benefit calculus used to weigh and compare incentives and disincentives.

G. CASE STUDIES

When a study can not be limited to a single level of analysis it becomes necessary to focus the study utilizing a set of research questions. The research questions reflect the nuclear-export incentives and disincentives of the motivational hypothesis. This study of China's export activities includes the following questions: China's motivations to conduct nuclear transactions; the structure of China's export control system; the non-

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[67] Meyer, *The Dynamics of Nuclear Proliferation*, 73.

proliferation agreements and norms restricting China's nuclear export activities; and China's capability to export nuclear material, technology, equipment, and services. The answers to these questions help provide an explanation for China's behavior as an emerging nuclear supplier, which in turn has significant effects on the evolution of the international nonproliferation regime.[68]

Countries export nuclear technology and materials primarily to make money, thereby supporting the domestic nuclear industry's development and survival. China is no exception. In fact, China's nuclear exports to European and African countries, under IAEA safeguards, appear to have been motivated by just this incentive. It is not always in the best interest of the supplier to supply sensitive items to some potential customers, however, as such exports may result in the supplier being cut-off by other nations from much needed advanced technology. Indeed, the United States has imposed sanctions against China for what the United States deemed "proliferation-questionable" exports.[69] Emerging suppliers, however, may export to politically questionable customers in order to obtain a foothold in the market and prevent commercial domination by traditional suppliers. It appears China may have used this tactic when exporting heavy water significantly below the world market price.

One factor constraining emerging nuclear suppliers is the availability of resources. Emerging suppliers tend to be limited in their depth of skilled personnel and ability to indigenously produce necessary component parts. There have been instances in which

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[68] *International Nuclear Trade and Nonproliferation*, William C. Potter, ed. (Lexington, MA: Lexington Books, 1990) 8-9,21.

[69] The United States twice imposed sanction (1991 and 1993) in response to China's export of missile-related technology to Pakistan.

China's nuclear-export activity has been constrained by its inability to manufacture the parts.[70] When China's announced its agreement to build two 300MW reactors for Iran, western analysts predicted the project would never be completed because China was not technically capable of building the reactors without importing key components from abroad.[71] National security and political interests also limit to whom and under what circumstances emerging suppliers export nuclear materials and technology. Essentially, suppliers must balance all three categories of incentives and disincentives. It is just this type of cost-benefit calculus that China uses to govern its nuclear-export activities.

1. Pakistan

It is the assertion of the United States that China showed a pattern of insensitivity to the non-proliferation regime by freely exporting to countries with presumed nuclear ambitions, particularly Pakistan and Iran. Nuclear exports to Pakistan have been the source of diplomatic problems for China. The explanation for China's export activities to Pakistan lies in China's view of its strategic interests and the cost-benefit calculus of Chinese decision-makers.[72]

Pakistan has played several vital roles in China's strategic security. It has been China's window to the third world. When China sought official relations with other Middle Eastern nations, Pakistan provided the point of access. Pakistan has also been

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[70] *International Nuclear Trade and Nonproliferation*, 32.

[71] Andrew Koch and Jeanette Wolf, *Iran's Nuclear Facilities: A Profile* (Monterey, CA: The Center For Nonproliferation Studies, 1998). CNS Database, MIIS. Available Online: http://cns.miis.edu/db/archives/nuc/eos/ [03 Mar 99].

[72] *International Nuclear Trade and Nonproliferation*, 253.

integral to the Sino-U.S. relationship, acting as an intermediary in China's opening to the United States. In these ways, Pakistan has been associated with the reworking of China's external relationships. Pakistan also played a crucial role in preventing the consolidation of Soviet control during the Afghanistan war, thus enhancing its value to China and the United States. During the war, in fact, the United States turned a blind eye to Pakistan's nuclear weapons program.[73]

Considering Pakistan's importance, it is not surprising that China responded positively to requests for nuclear cooperation from this longstanding ally. Cooperation meant investing in an important diplomatic asset. When Pakistan began making requests for more sensitive technology, it is possible China did not want to antagonize a prized ally by denying the request. It is also possible China witnessed Pakistan's determination and calculated it would build the bomb anyway. Therefore, China decided to garner the dividends of cooperation.[74]

Regionally, Pakistan has counterbalanced India and its nuclear program. China's alliance with Pakistan, however, poses a dilemma in light of India's growing military strength. In another Indo-Pakistan war, it is likely that India would gain the upper hand. Responding to a request for assistance from Pakistan in such an event could create an unwanted military conflict with India. A failure to respond would result in loss of credibility with an important ally. A nuclear-armed Pakistan, however, is in a position to stalemate India. Apparently, China determined that the benefits of nuclear cooperation

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[73] Ibid., 255.

[74] Ibid., 256-257.

with Pakistan outweighed the risks of an accelerated Indian nuclear program and possible censure from the non-proliferation regime.[75]

Finally, China's tolerant attitude towards proliferation in general may have influenced China's nuclear-export activities with respect to Pakistan. Historical events indicate that in contrast to the official views of other nuclear states China would be relatively less troubled by the spread of nuclear weapons on the sub-continent. This tolerant attitude is due to two reasons: a lingering residue of China's policy advocating every state's right to develop nuclear weapons; and China's strategic culture, which enjoys a powerful belief in China's capacity to survive.[76]

In sum, the evidence suggests a four-part explanation for China's nuclear assistance to Pakistan; first, a fear of Pakistani military weakness vis-à-vis India; second, a geostrategic interest in a strong, friendly Pakistan; third, the continuation of an ongoing program of nuclear cooperation; and fourth, a relatively benign attitude towards nuclear-weapons proliferation in general.[77]

2. Iran

China's other nuclear transactions do not raise the same tangible security issues. China's relatively benign attitude towards proliferation may contribute to China's lack of inhibition about engaging in nuclear commerce and lack of domestic export controls. In strategic terms, it appears China would not be troubled by the incremental progress of

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[75] Ibid., 257.

[76] *Quotations From Chairman Mao Tsetung*, 82-87.

[77] *International Nuclear Trade and Nonproliferation*, 257-258.

weapons programs in threshold states outside of its region. Economic gains, as well as strategic and political considerations, play a more influential role in China's nuclear-export activity to these countries.[78]

One plausible explanation for Chinese nuclear-export activities lies in its civilian nuclear-energy program and the energy demands of its economic development plans. China's overall energy program calls for a doubling of the country's energy supply by the end of the century. Although nuclear energy has been earmarked to make a significant contribution to meeting its rapidly growing energy needs, China lacks the hard currency necessary to develop and support its civilian nuclear-energy program. With insufficient financial support from the central government, China's nuclear industry has been dependent on nuclear exports to raise the hard currency needed to cover the cost of advanced technology and equipment from abroad.[79]

China's nuclear cooperation with Iran provided a means of acquiring hard currency, as well as a means for increasing its influence in the region. As an oil-rich nation, Iran is able to offer hard currency or natural resources, or both, as a form of payment for nuclear related technology. Politically, China's nuclear exports to the Middle East were intended to help establish China as an active leader in the developing world.[80] It was not until the benefits of non-cooperation outweighed the benefits of cooperation that China ceased its nuclear cooperation with Iran. China agreed to cease

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[78] *International Nuclear Trade and Nonproliferation*, 258; R. Bates Gill, *The Challenge of Chinese Arms Proliferation: U.S. Policy for the 1990s*, (Carlisle Barracks, PA: Strategic Studies Institute, U.S. Army War College, 1993) 13.

[79] *International Nuclear Trade and Nonproliferation*, 258-260.

[80] Gill, *The Challenge of Chinese Arms Proliferation*, 14, 19.

nuclear cooperation with Iran in exchange for receiving nuclear cooperation from the United States. As civilian trade increased, the acquisition of advanced technology from the United States became more important than the acquisition of hard currency from Iran. Additionally, China's image as a responsible nuclear power and the benefits that image provides have also accumulated value in China's balance of political and economic priorities.

H. CONCLUSION

There is no single theory that completely explains China's nuclear exports, nor is there any single factor that determines a pattern of behavior in China's nuclear exports. Chinese nuclear-export policy decision-making is based on a cost-benefit analysis of a number of variables. The importance of each, and therefore the weight attached to each factor, is dependent upon the national priorities and interests at the time of the decision to export.

As a source of hard currency, China's nuclear exports have helped strengthen China's domestic economy, and have provided funding for technological developments and the acquisition of foreign technology. As a diplomatic strategy, China's nuclear exports have forced the core states to acknowledge and deal with China on their level. China's nuclear exports have also enhanced its image among developing nations, particularly those to which China is willing to export nuclear materials and technology. Internally, a growing community of proliferation experts and organizations, as well as government bureaucracies competing for money have influenced China's export policy.

There have also been specific instances in which China's nuclear exports have been the result of the inability of the Chinese government to enforce their non-proliferation policy through effective export controls, as in the sale of ring magnets to Pakistan and the attempted sale of anhydrous fluoride to Iran.[81] China may still lack the funding and the manpower to enforce export controls.[82] China's central government may also face bureaucratic resistance to tighter controls, as it was the necessity to earn hard currency that led individual ministries to export nuclear technology and materials in the first place.[83]

All of these factors have influenced China's nuclear export decision-making. As external and internal conditions change, the relative influence of each incentive and disincentive changes. Therefore, it is possible that the motivational profile prompting each of China's nuclear exports is unique, but each can be identified by determining the incentives and disincentives present.

China's increased participation in the international nuclear non-proliferation regime is not only an export disincentive but also a window to China's changing national interests. China's decision-makers use the same cost-benefit calculus for decisions to participate as they do for decisions to export. China's changing motivational profile is

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[81] China's current nuclear export controls consist of three main components; the State Council Circular on Nuclear and Nuclear-Related Dual-Use Export Controls (May 1997), Nuclear Export Control Regulations (September 1997), and Decree No. 245, Regulations on Export Control of Dual-Use Nuclear Products and Related Technologies. *China's Nuclear Export Controls*, CNS Database, MIIS [21 Nov 1998].

[82] "Engaging China on Nonproliferation," testimony by Deputy Assistant Secretary of Defense for Non-proliferation, Robert Einhorn before the Subcommittee on International Security, Proliferation, and Federal Services, Senate Committee on Government Affairs, 10 April 1997, *China's Export Controls*, CNS Database, MIIS [21 Nov 1998].

[83] Gardner, *Nuclear Non-Proliferation: A Primer*, 115,119.

the cause of China's increased participation. Participation should not be mistaken as the product of U.S. efforts to convince China that its exports are proliferation violations. The following chapters outline China's non-proliferation commitments and nuclear exports. These chapters show China has not violated its non-proliferation commitments, but has found ways of pursuing its national interests within the framework of its non-proliferation obligations.

Furthermore, through a study of China's national priorities and nuclear-export incentives and disincentives, the resulting motivational profile data could become a valuable basis for forecasting nuclear-export intentions. Motivational profile data could also become the basis for foreign policy recommendations aimed at changing motivational conditions in order to influence nuclear-export decisions.

III. NON-PROLIFERATION COMMITMENTS

A. INTRODUCTION

The international nuclear non-proliferation regime emerged from the International Atomic Energy Agency (IAEA), which was founded in 1957 as part of the Atoms for Peace program. The regime is based on the shared principle that the spread of nuclear weapons is detrimental to world peace and to the security of individual states. It is supported by a complex web of treaties, agreements, domestic laws, and export controls. Widely accepted international norms, however, are only now beginning to emerge.

Critics observing China's nuclear-export activities question China's commitment to the institutions and values of the international non-proliferation regime. Critics also question the credibility of China's non-proliferation pledges. As an emerging nuclear supplier, China is viewed as the main violator of the international non-proliferation regime. China's non-proliferation policy is defined, in part, by the restrictions of the regime. Adherence to these restrictions depends on the value China places on the functionality of the regime and the factors that influenced China to join it. Therefore, to understand China's non-proliferation policy, it is necessary to understand its motivation to participate in the international nuclear non-proliferation regime.[84]

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[84] Gary T. Gardner, *Nuclear Non-Proliferation: A Primer* (London: Lynne Rienner Publishers Inc., 1994), 53; Center for Non-Proliferation Studies (CNS) Database, Monterey Institute of International Studies (MIIS). Available Online: http://www.cns.miis.edu/db/china/ [21 Nov 1998]; Mingquan Zhu, "The Evolution of China's Non-Proliferation Policy," *The Non-Proliferation Review* 4, no. 2 (winter 1997): 40; Wendy Frieman, "New Members of the Club: Chinese Participation in Arms Control Regimes 1980-1995," *The Non-Proliferation Review* 3, no. 3 (spring-summer 1996): 15, 28.

China's nuclear non-proliferation policy has evolved considerably in the last 15 years, ultimately coming into close agreement with U.S. policy. This evolution of China's policy can be divided into three stages: 1949-1954, when China championed nations' rights to develop nuclear weapons; 1954-1984, when China accepted the principle of non-proliferation but remained independent of the regime; and 1984-present, when China gradually integrated itself into the international non-proliferation community.[85]

This chapter focuses on the final stage of policy evolution, examining not only the nuclear non-proliferation treaties, agreements, and organizations in which China has chosen to participate, but also the factors that influenced China to participate in them. The commitments China has made are evaluated to determine whether there is a pattern of Chinese behavior, or perhaps a common motivator for Chinese participation in the nuclear non-proliferation regime.

B. INTERNATIONAL ATOMIC ENERGY AGENCY

China's participation in the international nuclear non-proliferation regime began in 1984 when it became a member of the International Atomic Energy Agency (IAEA). The IAEA was formed to promote the peaceful use of nuclear energy, and to guard against the diversion of nuclear materials to military use or weapons programs. IAEA safeguards are the mechanism used to achieve these goals.

There are two types of safeguards: limited-scope, which are placed on individual exports; and full-scope, which are placed on all materials and facilities (including

[85] Zhu, "The Evolution of China's Non-Proliferation Policy," 40.

peaceful activities) within a country's territory. Limited-scope, or "item only" safeguards leave open the possibility for technology to be transferred or copied to an unsafeguarded facility in a parallel nuclear program. Parallel programs have become the primary concern of the non-proliferation regime, particularly in the case of Chinese nuclear exports. China is the only major nuclear supplier that does not require full-scope safeguards as a condition of export.[86]

1. Obligations

Membership in the IAEA and the use of safeguards are voluntary. After China became a member, Jiang Xinxiong, Minister of China's Nuclear Industry, stated China would "request the recipient countries to accept safeguards in line with the principles established by the [IAEA] statues." A Chinese Foreign Ministry spokesman repeated this statement in November 1985.[87] In 1988, China signed an agreement with the IAEA guaranteeing it would require recipients of Chinese nuclear exports to accept IAEA safeguards. Since joining the IAEA, China has required limited-scope safeguards on certain exports to Algeria, Chile, Ghana, Nigeria, Pakistan, Iran, and Syria.

Implementation of safeguards requires an agreement between the recipient country and the IAEA.[88] As the source country, China is only obligated to make such an

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[86] Gardner, *Nuclear Non-Proliferation: A Primer*, 64, 95; *International Atomic Energy Agency (IAEA)*, CNS Database, MIIS [21 Nov 1998].

[87] Gary Milholin and Gerard White, "Bombs From Beijing: A Report on China's Nuclear and Missile Exports," (May 1991) 15, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/ [21 Nov 1998]; Weixing Hu, "China's Nuclear Export Controls: Policy and Regulations," *The Non-Proliferation* Review 1, no. 2 (winter 1994) 4.

[88] IAEA INFCIRC/66 and INFCIRC/153 are the principle nuclear safeguards model agreements referenced in safeguard negotiations.

agreement a stipulation of export in order to fulfill its membership promise. China is not required to enforce the agreement between the IAEA and the recipient state. Furthermore, the IAEA itself does not have a mechanism for enforcing safeguard agreements. The IAEA holds routine inspections in accordance with safeguard agreements to detect violations. If violations are detected, the IAEA reports the violations to the UN, which has the option of imposing sanctions. Safeguards simply alert the international community to the diversion of material and technology to a weapons program, they do not prevent it.[89]

As an IAEA member, China also acceded to the universal reporting scheme for the import and export of nuclear material. In November 1991, the IAEA received an official letter stating China would report any export of nuclear materials of one kilogram or greater to Non-Nuclear Weapon States. In 1993, China pledged to report all imports and exports of nuclear material and equipment.[90] China is obligated by its IAEA membership and subsequent pledges to report all imports and exports of nuclear material and equipment to the IAEA, and to require a minimum of limited-scope safeguards as a precondition of export to any NNWS.

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[89] *International Atomic Energy Agency (IAEA)*, CNS Database, MIIS [21 Nov 1998]; Gardner, *Nuclear Non-Proliferation: A Primer*, 68, 96, 118.

[90] "China Arms Control and Disarmament," Information Office of the State Council of the People's Republic of China, November 1995, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/ [18 Jan 1999]; Gardner, *Nuclear Non-Proliferation: A Primer*, 45.

2. Motivating Factor

China views the world in balance-of-power terms and takes a self-help approach to security.[91] All states make their policy decisions based on their perspective in the central paradigm. The paradigm consists of the answers to the following questions: 1) What is the frequency of conflict in interstate affairs? 2) What is the nature of possible adversaries and the threats they pose? 3) Is there efficacy in the use of force? The extreme ends of the paradigm are *realpolitik* and *idealpolitik* perspectives.[92]

The *realpolitik* position accepts the inevitability of major conflict and that the adversary is predisposed to seek your elimination. A *realpolitik* position prefers offensive, coercive, unilateral approaches to security. The corresponding arms-control policy minimizes constraints on one's own capabilities while maximizing the constraints on the capabilities of others.[93]

The *idealpolitik* position considers war an aberrant event, and assumes that the adversary will accept a price short of one's own capitulation. An *idealpolitik* position prefers accommodationist, cooperative security strategies. The corresponding arms-control policy emphasizes agreements, which reduce the incentives for both sides to use force.[94] Before entering the non-proliferation regime, China was positioned at the far *realpolitik* end of the central paradigm.

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[91] For a more in-depth discussion of this theory on China's perspective on international relations issues see Banning N. Garrett and Bonnie S. Glaser, "Chinese Perspectives on Nuclear Arms Control," *International Security* 20, no. 3 (winter 1995).

[92] Alastair Iain Johnston, "Learning Versus Adaptation: Explaining Changes in Chinese Arms Control Policy in the 1980s and 1990s," *The China Journal*, no. 35 (January 1996) 31.

[93] Ibid., 32.

[94] Ibid., 33.

Given China's international position, political philosophy, and security perspective, there are several theories on why China chose to join the IAEA, thereby entering the international non-proliferation regime. The first theory suggests that China's participation is a reluctant response to international pressure. China's drive for economic modernization led to interaction with international institutions. Once this relationship was established, China was compelled by international pressure and concern for its own image as a responsible major power to develop concrete policy responses to the international arms-control agenda. China could not avoid dealing with proliferation issues without damaging its image.[95] Although this pressure played a part in China's decision; given China's *realpolitik* views, it is likely that China's non-proliferation policy was also changing at this time in response to the perceived threat environment. In the 1970s, as the Sino-Soviet split became more pronounced and the Soviet Union emphasized peaceful coexistence with the West, China feared U.S.-Soviet cooperation against China. It is possible the Reagan administration's active Soviet-containment policy combined with nuclear-cooperation initiatives with China alleviated this perceived threat. Additionally, Chinese leaders may have believed the forces restricting the dangers of war had made sufficient progress to put China in a less threatened position, making them more willing to cooperate with the outside world on political and security issues.[96] The removal of forces discouraging China's participation does not necessarily explain why it join the nuclear non-proliferation regime, but it does help explain the timing.

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[95] Ibid., 57-58.

[96] Garrett and Glaser, "Chinese Perspectives on Nuclear Arms Control," 44-48.

A second theory proposes that China initially wanted to join the international non-proliferation regime for economic, as well as strategic reasons. Deng Xiaoping's economic reforms and "open door" policy began to integrate China into the global economy. These reforms required a stable domestic environment and peaceful international environment in order to achieve successful economic growth. Chinese leaders came to understand that nuclear non-proliferation offered potential security benefits to China, as a commitment to non-proliferation was a precondition for nuclear cooperation with advanced countries.[97] They also realized the self-help approach alone was inadequate for ensuring a stable international environment for economic development and modernization. China could not influence the international environment by remaining isolated from it. Moreover, the Chinese leadership recognized the linkages between participation in international security regimes and the acquisition of economic advantages in the global economy. This theory represents a significant change in the thinking of the Chinese leadership.[98]

Individually, each of the proposed theories offers a partial explanation for China's decision to join the IAEA and enter the non-proliferation regime. China's decision to become a member of the IAEA was based on a pragmatic cost-benefit calculus. International pressures, strategic concerns, and economic considerations were all factors influencing China's leadership. On one hand, the cost of membership was a perceived compromise of sovereignty, as China was obligated to report all nuclear exports, making

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[97] Johnston, "Learning Versus Adaptation," 36, 50.

[98] Zhu, "The Evolution of China's Non-Proliferation Policy," 15; Frieman, "New Members of the Club," 44; Garret and Glaser, "Chinese Perspectives on Nuclear Arms Control," 76.

them accessible to international scrutiny and censure. On the other hand, membership placed no restrictions on China's domestic nuclear program and put very few restrictions on China's nuclear trade, as participation in the IAEA is based on voluntary disclosure and compliance with minimal verification procedures.

Although leaders remained suspicious that western powers had intended to thwart China's economic development, participation did not hinder modernization efforts. China's membership in the IAEA improved its image with technologically advanced nations by signaling China's commitment to non-proliferation. This opened the door for nuclear cooperation with the United States and other western countries. By 1985, the international nuclear non-proliferation regime had grown to include the Nuclear Non-Proliferation Treaty, the Zangger Committee, and the Nuclear Suppliers Group, from which norms of acceptable nuclear-supplier policy were developing. Participation in the IAEA helped to deflect criticism of China's nuclear policies. Membership in the IAEA also provided China another means of influencing the international environment in order to ensure stability, thereby facilitating China's economic reconstruction. These factors made the cost of membership low relative to the benefits of participation.[99]

C. NUCLEAR-WEAPON-FREE ZONES

A Nuclear-Weapon-Free Zone (NWFZ) is an agreement prohibiting the acquisition, stockpiling, deployment, and testing of nuclear weapons in a given region. Currently there are four established NWFZs: Southeast Asia NWFZ, African NWFZ,

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[99] Garret and Glaser, "Chinese Perspectives on Nuclear Arms Control," 47-49.

South Pacific NWFZ, and Latin American and Caribbean NWFZ. On various occasions, China has stated its support for the establishment of NWFZs. [100]

1. Obligations

China signed and ratified the relevant protocols of the Treaty of Tlatelolco (Latin America and Caribbean NWFZ) in August 1973 and the Treaty of Rarotonga (South Pacific NWFZ) in October 1987. China also signed the Treaty of Pelindaba (African NWFZ) in April 1996. [101] By signing these treaties, China agrees not to use or threaten to use nuclear explosive devices against parties to the treaty or other territories within the designated zone, and not to test or deploy nuclear explosive devises within the zone. Although China supports the Treaty of Bangkok (Southeast Asian NWFZ), it objects to the fact that the geographical scope of the zone includes portions of the South China Sea, an area over which China claims sovereignty.

2. Motivating Factors

Since China's official nuclear policy is both not to initiate the use of nuclear weapons and not to threaten the use of nuclear weapons against NNWS, signing treaties for the establishment of NWFZs does not place any additional restraints on China. Additionally, China has not tested its nuclear weapons outside of its own territory; therefore, NWFZs do not place any restraints on China's domestic nuclear program.

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[100] Statement by the Head of the Delegation of the People's Republic of China at the 1995 Review and Extension Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, 18 April 1995, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/engdocs/ [18 Jan 1999].

[101] *Nuclear Weapon-Free Zones (NWFZs)*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nwfzorg [19 Nov 1998]; *South Pacific Nuclear Free Zone Treaty*, CNS

By supporting NWFZs, China uses these confidence-building measures to alleviate an important concern of developing nations (i.e., that they will be attacked by a nuclear power). This support earns China a certain amount of respect and prestige from Third World NNWSs. China's support of NWFZs has the benefit of enhancing its image as a responsible nuclear power with both NNWSs and advanced nuclear states, while minimizing the impact of regime participation on its own relative capabilities.[102] China's view of the South China Sea as Chinese territory likely explains why China has not yet signed the Treaty of Bangkok.

D. 1985 U.S.-CHINA NUCLEAR COOPERATION AGREEMENT

The U.S.-China Nuclear Cooperation Agreement (NCA) was signed on July 23, 1985. This agreement was deemed necessary because of the 1954 Atomic Energy Act (AEA), which requires a nuclear-cooperation agreement in order for the U.S. to export nuclear materials or equipment. Section 129 of the AEA prohibits the export of nuclear materials, equipment, or technology to countries that have encouraged any NNWS to acquire nuclear explosive devices or have agreed to transfer reprocessing equipment, materials, or technology to a NNWS.[103]

Other domestic legislation effecting the U.S.-China Nuclear Cooperation Agreement are the Joint Approval Resolution (P.L. 99-183) and the 1990 Tiananmen

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Database, MIIS. Available Online: http://cns.miis.edu/db/china/ [05 Oct 1998].

[102] Johnston, "Learning Versus Adaptation," 57-58.

[103] *Atomic Energy Act*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/ [20 Dec 1998].

Square Legislation (P.L. 101-246). The Joint Approval Resolution requires presidential certification of certain conditions before the NCA can be enacted. These conditions include the implementation of effective verification measures to ensure that U.S. exports are used only for peaceful purposes, to require that China provide additional information on its nuclear non-proliferation policies, and that this information demonstrate that China is not in violation of AEA Section 129. The Tiananmen Square Legislation additionally requires not only the certification that China is not assisting and will not assist NNWSs to acquire nuclear explosive devices, but also evidence of progress in political reforms throughout the country, including Tibet. According to U.S. officials, China also must provide assurance that its export-control system is functioning.[104]

The NCA is different from other non-proliferation agreements in that it is a reward-based agreement. China has agreed to certain requirements to be able to receive nuclear exports from the United States. U.S. domestic laws do not directly prohibit China from particular proliferation actions, or require China to fulfill any non-proliferation obligations; nonetheless, the NCA and associated legislation prohibit U.S. companies from selling nuclear materials, technology, and facilities to China unless the appropriate certifications are made. In order to show a party has violated the treaty, the Nuclear Non-Proliferation Treaty requires proof of assistance in acquiring nuclear explosive devices, whereas the NCA is more active, requiring proof of non-assistance to be enacted. If China meets the requirements of the agreement, then it is rewarded with U.S. nuclear

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[104] *1985 US-China Nuclear Cooperation Agreement (NCA)*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/ [20 Dec 1998].

trade. This benefit is a strong incentive for China to conform to a non-proliferation policy more acceptable to the United States.

E. NUCLEAR NON-PROLIFERATION TREATY

The Nuclear Non-Proliferation Treaty was designed to prevent the spread of nuclear weapons and promote the peaceful uses of nuclear energy. These two objectives seem increasingly at odds in a world of dual-use technology. The Treaty was first opened for signature on July 1, 1968. On that date, it was signed by the United States, the Soviet Union, and 60 other countries. Initially, China declined to sign the Treaty, denouncing it as a "conspiracy concocted by the United States and Soviet Union to maintain their nuclear monopoly." China viewed the NPT as an attempt by the two superpowers to limit the horizontal proliferation of nuclear weapons, while remaining free to engage in unhindered vertical proliferation.[105]

China continued to criticize the NPT for its discriminatory nature even after accepting the principle of nuclear non-proliferation.[106] One of the first indications of a changing Chinese perspective was the observer delegation sent to the fourth NPT review conference held in September 1990. Ambassador Hou Zhitong, head of the delegation, stated that the Treaty had played a positive role in preventing the proliferation of nuclear

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[105] Zhu, "The Evolution of China's Nuclear Non-Proliferation Policy," 43; *Nuclear Non-proliferation Treaty (NPT)*, CNS Database, MIIS [19 Nov 1998].

[106] *Xinhua*, 5 November 1983, in FBIS Special Memorandum 18 December 1992; *Xinhua*, 11 January 1984, in FBIS Special Memorandum 18 December 1991; *NPT-Related Statements and Developments*, CNS Database, MIIS [21 Nov 1998].

weapons.[107] In August 1991, Chinese Premiere Li Peng announced that China had agreed in principle to participate in the Nuclear Non-Proliferation Treaty. On March 11, 1992 Chinese Foreign Minister Qian Qichen submitted China's formal instrument of accession to the Non-Proliferation Treaty to British Prime Minister John Major.[108]

1. Obligations

China signed the NPT as a Nuclear Weapons State (NWS). As such, China agreed to the following under Article I:

> not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly, or indirectly, and not to assist, encourage, or induce any non-nuclear weapons state (NNWS) to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, or control over such weapons or explosive devices,[109]

Under Article III China agreed to the following:

> not to provide source or special fissionable material, or equipment or material especially designed or prepared for the processing, use or production of special fissionable material to any NNWS for peaceful purposes unless the source or special fissionable material shall be subject to safeguards.[110]

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[107] *Xinhua*, 12 September 1990, in FBIS memorandum, 18 December 1991; *NPT-Related Statements and Developments*, CNS Database, MIIS [21 Nov 1998].

[108] *Xinhua*, 10 August 1991, in FBIS Special Memorandum, 18 December 1991; *NPT-Related Statements and Developments*, CNS Database, MIIS [21 Nov 1998]; "China Formally Acceded to the Non-Proliferation Treaty," *Nuclear News*, April 1992; *NPT-Related Statements and Developments*, CNS Database, MIIS [21 Nov 1998].

[109] *The Treaty on the Non-Proliferation of Nuclear Weapons*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/engdocs/npt.htm [21 Nov 1998].

[110] Ibid.

This article obligates China to ensure that all NNWS recipients negotiate and conclude an agreement with the IAEA for the application of limited-scope safeguards on exports that fall under the defined material and equipment.

As a NWS, China's domestic materials and facilities are not subject to safeguards. The NPT has no formal compliance mechanism. IAEA safeguards do not effectively verify the compliance of NWSs with Article I of the NPT. Other member states must provide evidence of non-compliance. The role of safeguards is to verify the compliance of NNWSs, who are the recipients of nuclear exports with their obligations under the NPT.

Articles IV and V protect the rights of all parties to develop and use nuclear energy for peaceful purposes. This has become a point of contention between the United States and China. China insists all its exports are strictly for peaceful purposes, but the United States argues China's dual-use exports are assisting other states in the development of nuclear weapons programs. As with other treaties, the language of the NPT is imprecise, leaving room for interpretation by each party. This is one possible explanation of why China's commitment to the details of the NPT remains unclear.[111]

2. Motivating Factors

If China was so critical of the NPT, why did its leadership decide to sign the treaty? There were several factors that led China to believe it was advantageous to join rather than to remain outside the treaty framework. China's official nuclear policy has

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[111] *The Treaty on the Non-Proliferation of Nuclear Weapons*, CNS Database, MIIS [21 Nov 1998]; Gardner, *Nuclear Non-Proliferation: A Primer*, 22, 122-124.

been to seek the "complete prohibition and thorough destruction" of nuclear weapons. China accepted non-proliferation as a necessary step in achieving this goal, and accepted the NPT as an essential tool for stopping the spread of nuclear weapons. When China signed the NPT, 185 countries had already signed.[112] It was becoming increasingly difficult for China to dismiss the treaty as a superpower conspiracy. Additionally, the treaty had been in force for twenty-three years and had proven successful.[113]

China's desire to correct the "imbalance" and make the NPT less discriminatory against NNWSs did not diminish when it signed the treaty. Instead, China realized that arms control was continuing to move forward without Chinese participation. Chinese leaders decided it would be wise to try and influence the process instead of remaining isolated on non-proliferation issues. Therefore, China signed the treaty in order to work more effectively for disarmament from a position within the organization.[114]

Other international events influenced China's non-proliferation policy. The end of the Cold War made it easier to reconcile the international non-proliferation regime with China's national security interests. China was no longer caught between two superpowers on the brink of conflict. In the past, China defended its decision not to participate in non-proliferation treaties by criticizing the United States and Soviet Union as the worst offenders for not adequately pursuing the "cessation of the nuclear arms race and nuclear disarmament" in accordance with Article VI of the NPT. It became more

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[112] Rodney W. Jones and Mark G. McDonough, *Tracking Nuclear Proliferation: A Guide in Maps and Charts, 1998*, (Washington D.C.: Carnegie Endowment for International Peace, 1998) 19-22.

[113] The international nuclear non-proliferation regime has been credited with the de-nuclearization of Belarus, Kazakhstan, and Ukraine following the dissolution of the Soviet Union, and with South Africa's elimination of its six nuclear weapons. Jones and McDonough, *Tracking Nuclear Proliferation: 1998*, 4.

[114] Frieman, "New Members of the Club," 26.

difficult to deflect criticism or justify China's own behavior as the United States and Soviet Union increasingly negotiated successfully towards disarmament. The demise of the former Soviet Union and the shift of U.S. foreign-policy focus, also put China in an unflattering international spotlight.[115]

In addition to the end of the U.S.-Soviet nuclear arms race, China's reversal of position on the NPT was influenced by the following: France's decision to join the treaty; a post-Tiananmen desire to improve China's image in the West; the need for economic assistance from Japan; and a growing appreciation that arms control enhances security.[116] Once France decided to join the NPT, China remained the only NWS not to sign the treaty. This left China isolated among its NWS peers in highlighting the discriminatory nature of the treaty and weakened China's argument that the treaty was arbitrarily imposing the rules of the superpowers on the rest of the world.[117] When asked to comment on France's decision to sign the NPT, a Chinese Foreign Ministry Spokesman stated, "China is now seriously studying France's initiative on global arms control and disarmament."[118]

During this time, China continued to pursue economic growth, which required foreign currency. China however, found itself economically isolated by sanctions imposed in response to the Tiananmen Square incident, sanctions which could potentially have hurt China's economic growth in the long run. In order to break out of isolation,

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[115] Ibid., 26.

[116] Garret and Glaser, "Chinese Perspectives on Nuclear Arms Control," 50.

[117] Ibid., 51,76.

[118] *NPT-Related Statements and Developments*, CNS Database, MIIS [21 Nov 1998].

obtain economic assistance, and improve its international image, China needed to appear cooperative in a multilateral arena. Signing the NPT was an opportunity to do this.[119] Finally, there was increasing support in China for the position that the multilateral non-proliferation structure enhances security. Arms-control experts at the China Institute of Contemporary International Relations, which provides policy recommendations to Chinese leaders, stated, "We now see the NPT as enhancing China's security." [120] Whereas China's self-help security only defended against threats, the NPT helps reduce the likelihood that neighbors will pose a threat.

F. MISSILE AND TECHNOLOGY CONTROL REGIME

1. Obligations

One month prior to signing the NPT, China agreed to adhere to the original, 1987 guidelines of the Missile and Technology Control Regime (MTCR). This agreement was communicated in a classified letter to the Bush administration. The MTCR is an informal set of guidelines regulating the export of missiles, unmanned aerial vehicles, and related technology. The guidelines of the agreement specifically regulate the export of systems capable of carrying at least a 500-kilogram payload a distance of at least 300 kilometers. Chinese missiles were the primary target of the MTCR. The original guidelines were only concerned with nuclear-capable delivery systems. In 1993 however, the MTCR Partners extended the guidelines to include all systems capable of carrying any weapons

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[119] *Missile and Technology Control Regime (MTCR)*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/mtcrorg.htm [18 Jan 1999]; Johnston, "Learning Versus Adaptation," 36, 50.

[120] Frieman, "New Members of the Club," 20.

of mass destruction (WMD) including nuclear, chemical, and biological.[121] The MTCR annex lists two categories of equipment and technology regulated by the agreement. Category I covers complete systems and Category II includes a range of parts and components that may be exported at the discretion of the MTCR Partner government, on a case-by-case basis, for acceptable end-uses. China has not agreed to accept the annex or the 1993 revised guidelines. In October 1994 however, China reaffirmed its commitment to the MTCR by agreeing to regulate exports based on the concept of inherent capability regardless of the demonstrated or advertised combination of range and payload.[122] Both official pledges were presented to the United States in exchange for the lifting of sanctions.[123]

2. Motivating Factors

The terms of the MTCR agreement are imprecise, allowing for case-by-case transfers. Additionally, the agreement has no multilateral enforcement or verification process. Although adherence to the MTCR costs China some of its arms trade, any accusation by the U.S. of treaty violations can be dismissed as an unilateral attempt to thwart China's arms trade. Moreover, China's initial pledge to abide by the MTCR guidelines was vague. The imprecise nature of the agreement and of China's pledge left China room for negotiation. The United States solicited the 1994 pledge to clarify

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[121] *Missile and Technology Control Regime (MTCR)*, CNS Database, MIIS [18 Jan 1999].

[122] China's M-11 missile has a demonstrated range of approximately 250km with acceptable accuracy but is inherently capable of ranges exceeding 300km.

[123] *Missile and Technology Control Regime (MTCR)*, CNS Database, MIIS [18 Jan 1999]; Frieman, "New Members of the Club," 20.

China's obligations under the MTCR. Although China has agreed to abide by the guidelines of the MTCR, it is not a member of the regime. Therefore, China had no official input when the guidelines were changed in 1993. This has led to China's argument that it is a victim of "shifting goalposts." The cost to China of abiding by the agreement, however, is less than the impact of sanctions required by U.S. law for violations. China's adherence to the MTCR guidelines is an example of how China's participation in the non-proliferation regime is partially a reluctant response to international pressure.[124]

G. SINO-SOVIET NO-FIRST-USE AGREEMENT

In addition to multilateral treaties and agreements, China's participation in the international non-proliferation regime includes significant bilateral agreements. In September 1994, China and the former Soviet Union entered into the Sino-Soviet No-First-Use Agreement.[125] China considers No-First-Use (NFU) pledges, as well as Negative Security Assurances (NSA)[126] necessary for non-proliferation to be successful. China believes such pledges will counter-balance the unequal terms of the NPT, which require NNWS parties to accept full-scope safeguards, but does not require any such safeguards for the NWS parties. In China's article of accession to the NPT, it called for

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[124] Frieman, "New Members of the Club," 21.

[125] *Sino-Soviet Detargeting and NFU Agreement*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/chrusdet.htm [19 Nov 1998].

[126] A no-first-use declaration is a confidence-building measure in which a nuclear-weapons state promises not to use nuclear weapons first. A negative security assurance is a declaration that a nuclear weapon state will not use nuclear weapons against a non-nuclear weapons state. It is intended to reassure non-nuclear weapon states.

all NWSs to make a pledge not to be the first to use nuclear weapons at any time or under any circumstances. Additionally, it called for the NWSs to pledge not to use nuclear weapons against any NNWS. China made both pledges in 1964, after detonating its first nuclear bomb.[127] Chinese officials also believe such pledges will reduce the threat of nuclear blackmail against NNWSs and ultimately lead to the elimination of nuclear weapons by diminishing their utility. Chinese officials believe NFU and NSA will also enhance mutual trust.[128]

China views itself as the champion of the rights of Third World nations. Emphasizing NFU and NSA as measures necessary for the success of the non-proliferation regime has the benefits China by reaffirming it's leadership role with respect to developing nations.[129] Completion of the Sino-Soviet NFU agreement not only enhances China's security, but also furthers China's political objective of obtaining a P-5 NFU agreement.

H. MAY 1996 PLEDGE

China has made additional bilateral agreements with the United States. China's May 1996 pledge (made by a Chinese Foreign Ministry spokesman) "not to provide

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[127] Statement by Chinese Vice Foreign Premier, *Beijing Review*, 30 March 1987, in FBIS Special Memorandum, 18 December 1991; *Sino-Soviet Detargeting and NFU Agreement*, CNS Database, MIIS [19 Nov 1998].

[128] *No First Use and Negative Security Assurances*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nfuorg.htm [21 Nov 1998].

[129] *China's Instrument of Accession to the Non-Proliferation Treaty (NPT) 11 March 1992*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nptdec.htm [21 Nov 1998]; Garret and Glaser, "Chinese Perspectives on Nuclear Arms Control," 64-67.

assistance to unsafeguarded nuclear facilities" is considered an important step in China's movement towards a non-proliferation policy that is consistent with international norms and acceptable behavior. This pledge covered the future sale of ring magnets and other nuclear-related items. The pledge was solicited by the United States following the discovery of the sale of ring magnets to Pakistan, and was given in response to exogenous pressures. China benefited directly from this agreement when the United States reciprocated by not imposing sanctions in response to the sale of ring magnets to Pakistan, and by resuming the normal operations of the U.S. Eximbank in China. Some U.S. officials consider this pledge evidence of how U.S.-China dialogue has brought the Chinese to a better understanding of their non-proliferation obligations.[130]

I. ZANGGER COMMITTEE

The Zangger Committee (ZAC) was formed in 1971 to clarify the vague safeguard requirements of the NPT. The ZAC developed a list of controlled items (a trigger list) that would require IAEA safeguards when exported. The trigger list was based on Article III of the NPT and includes such items as nuclear reactors, reactor pressure vessels, reactor control rods, reactor pressure tubes, deuterium and heavy water, and plants for the processing of irradiated fuel elements.[131] Although the development of the trigger list makes significant progress in clarifying NPT Article III, it does not specifically itemize

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[130] Carol Giacomo, *Reuters Executive News Service*, 14 May 1996, *Nuclear Abstracts*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/ [25 Jan 1999].

[131] A complete list of ZAC Trigger List items can be found in *IAEA Information Circular #209 (INFCIRC/209)*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/engdocs/ [18 Jan 1999].

all "component parts" of controlled items (Appendix Memorandum B, Section 2). Additionally, it does not specifically prohibit the retransfer of technology to similar facilities within the recipient country (Appendix Memorandum A, Section 5), nor does it include technology, technical assistance, technical data or dual-use items.[132]

1. Obligations

When China joined the ZAC in October 1997, 31 countries were already members.[133] By that time, international consensus had established the ZAC trigger list as a non-proliferation norm, and a useful tool for clarifying the obligations of the NPT. The trigger list is restrictive in that it requires IAEA safeguards on listed items. The ZAC however, determined that NPT Article III did not require full-scope safeguards; therefore, the ZAC trigger list requires only limited-scope safeguards. Moreover, the ZAC's informal legal status makes its statutes non-binding to NPT members who are not ZAC members.

2. Motivating Factors

Since China had already pledged to require limited-scope safeguards on nuclear exports, ZAC membership did not formally place any further significant restrictions on China's nuclear trade.[134] The ZAC trigger list only more clearly defined which items must be exported with IAEA safeguards. Therefore, ZAC membership came at a low cost

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[132] *IAEA Information Circular #209 (INFCIRC/209)*, CNS Database, MIIS [18 Jan 1999]; Gardner, *Nuclear Non-Proliferation: A Primer*, 57.

[133] *International Atomic Energy Agency (IAEA)*, CNS Database, MIIS [21 Nov 1998].

[134] Gardner, *Nuclear Non-Proliferation: A Primer*, 57.

for China. In exchange for abiding by ZAC guidelines, China has enhanced its image as a responsible nuclear power by actively participating in a non-proliferation organization whose guidelines are internationally acknowledged for promoting acceptable nuclear behavior. China's membership was not motivated by economics or security issues, but by the desire for international prestige.

J. NUCLEAR SUPPLIERS GROUP

1. Obligations

Following India's nuclear test in 1974, the United States proposed the formation of the Nuclear Suppliers Group (NSG) to ensure that suppliers uniformly followed a comprehensive set of guidelines so that nuclear cooperation did not contribute to nuclear proliferation. The original guidelines of the NSG adopted the ZAC trigger list, and added heavy water and heavy-water production plants. Additionally, these guidelines required the following: semi-full-scope safeguards;[135] provisions for the physical security of transferred materials; assurances that the materials would not be retransferred to a third party without originator consent; and a pledge by the recipient not to manufacture nuclear explosive devices.

The discovery of Iraq's clandestine nuclear-weapons program led members of the international non-proliferation regime to conclude that the limited-scope safeguards required by the NPT, ZAC, and NSG were not sufficient to prevent the transfer of nuclear technology and knowledge to unsafeguarded facilities. The ZAC and NSG also failed to

[135] Semi-full-scope safeguards would apply not only to the material being transferred, but also to the entire facility where the material was to be used.

stop the proliferation of dual-use items. In response to Iraq's clandestine activities, the NSG tightened its controls. In 1992, the NSG added 65 dual-use items to its trigger list and required full-scope safeguards on the transfer of all trigger-list items.[136] The revised NSG guidelines closed other loopholes left by the ZAC including restrictions on the following: the transfer of technology, technical assistance, and technical data (Annex A); the transfer of technology to similar facilities (Section 10); and the transfer of specific component parts (Annex B).[137]

2. Motivating Factors

Although China has declined membership in the NSG, it has pledged to abide by the original 1974 trigger list and safeguard requirements. This commitment, though somewhat ambiguous, represents a small step in the advancement of China's nuclear non-proliferation policy. China's May 1996 pledge to the United States not to assist unsafeguarded facilities essentially committed China to the use of semi-full-scope safeguards. Commitment to the 1974 NSG guidelines requires that before any transfer is made China obtain assurances that proper physical security will be provided and the material will not be retransferred without China's permission. For China, these are acceptable costs for the benefit of enhancing its international image as a responsible nuclear supplier. China's agreement to abide by the 1974 guidelines places neither any real restrictions on China's own nuclear capability nor any additional restrictions on its

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[136] Gardner, *Nuclear Non-Proliferation: A Primer*, 44-46, 58.

[137] Gardner, *Nuclear Non-Proliferation: A Primer*, 58; *Nuclear Suppliers Group (NSG)*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nsgorg.htm [19 Nov 1998]; *IAEA*

nuclear export policy. This limited participation allows China to improve its responsible nuclear-power image while resisting full NSG membership, which would put real constraints on China's nuclear trade.[138]

China is the only major nuclear supplier not to require full-scope safeguards. China's resistance to this requirement may be the result of domestic pressure, and China's nuclear industry is certainly opposed to full-scope safeguards, as they could jeopardize trade. Some of China's primary customers, including Iran and Pakistan, do not submit to full-scope safeguards. Their decision to conduct nuclear trade with China is most likely based on a combination of low cost, attractive financing packages, and limited-scope safeguard requirements.[139] By requiring full-scope safeguards, China's nuclear trade would be less attractive to Iran and Pakistan, and could possibly sever a source of income for China's nuclear industry.

K. CONCLUSION

In the last fifteen years, China has become increasingly supportive of the international non-proliferation regime. Through increased participation, China has slowly integrated itself into the regime. As new challenges emerge, such as Iraq's cladenstine nuclear weapons program, the requirements and obligations of nuclear suppliers tend to become more restrictive.

Information Circular (INFCIRC/254), CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/engdocs/ [18 Jan 1999].

[138] Johnston, "Learning Versus Adaptation," 49-50.

[139] *China's Nuclear Export Controls*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nucexcon.htm [21 Nov 1998]; Frieman, "New Members of the Club," 22.

Over time, China has deliberately become more involved in the negotiation stages of arms-control treaties and agreements. As a late-comer, China did not participate in regime development and, therefore, has had to accept the terms and conditions of treaties already negotiated by others. As a currently active member of the regime however, China now wants to be consulted before international agreements are reached. China's perspective on arms control has changed from that of a process that did not involve China, to one in which China needs to participate, or risk being politically isolated on these issues.[140]

As the international non-proliferation regime evolves to meet new proliferation challenges, new internationally accepted norms are beginning to emerge. Today, China is held to a higher standard of non-proliferation behavior than its nuclear-supplier peers were when the regime was first established. The changing nature of the regime has in a certain respects made China a victim of "shifting goalposts."

China's participation is self-perpetuating. As a result of its participation, China's international standing has improved, and its environment for negotiation has become more stable, making China more self-confident in international collaboration.

1. Benefits

China's motivation for participating in the international non-proliferation regime is based on an evaluation of all economic, political, and security factors by China's leadership. In the early 1980s, China's nuclear policy was to free-ride on the arms-

[140] Garret and Glaser, "Chinese Perspectives on Nuclear Arms Control," 46-47, 76; Gardner, *Nuclear Non-Proliferation: A Primer*, 96; Zhu, "The Evolution of China's Non-Proliferation Policy," 47; Frieman, "New Members of the Club," 26.

control agreements that restricted others. This policy facilitated extensive exports of heavy water. Even though China's official policy was non-proliferation, individual ministries had to earn hard currency for their own survival. China considers economic strength a necessity for participating as an equal partner in international cooperation. Additionally, China's leadership has realized there are increasing political and security benefits in multilateral nuclear-arms-control participation. The pervasive viewpoint among Chinese arms control experts is that nuclear proliferation is a threat to Chinese security, as it increases the probability of the use of nuclear weapons.[141]

Even though limited security interdependence is playing an increasingly important role in China's national security and foreign policy, this does not mean that China has abandoned its either self-help approach to national security or its balance-of-power view of the international community.[142] There is evidence that both a community of arms-control experts has developed in China, and that this community is exposed to new ideas through transnational linkages. Since 1980, China has rotated 74 individuals as representatives to the Conference on Disarmament. Between 1983-1993, there were arms-control articles written by 280 different authors published in legitimate journals. There have also been a variety of arms-control programs established by several institutions including the Commission of Science Technology and Industry for National Defense (COSTIND), the Ministry of Foreign Affairs (MFA), the Institute of Applied Physics and Computational Mathematics (IAPCM), and the People's Liberation Army

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[141] Frieman, "New Members of the Club," 20.

[142] Garret and Glaser propose this theory in "Chinese Perspectives on Nuclear Arms Control."

(PLA).[143] Moreover, transnational linkages have been established between Chinese and western arms-control experts as Chinese analysts spend time doing research in western strategic-studies institutes, including Stanford University's Center for International Security Arms Control, and the Stockholm International Peace Research Institute.[144]

There is little evidence, however, that these transnational linkages have influenced Chinese policy-makers' *realpolitik* assumptions about international relations. There has been no rejection of the *realpolitik* interpretation of security in Chinese arms-control writing. China continues to argue against a world order that undermines state sovereignty by placing priority on global interests. There is little evidence that global values predominate over Chinese national values or interests. Few of the Chinese arguments for participation in the regime endorse cooperative security. China's behavior is more consistent with a persistent *realpolitik* calculus. There is little evidence that China's growing arms-control community and transnational linkages have caused any paradigm shift among its policy-makers.[145]

Without this essential paradigm shift, the adaptation model appears to account for the evolution of China's non-proliferation behavior. Had a paradigm shift occurred, it would have led to more cooperative-security approaches, an end to defection and free-riding strategies, and declining resistance to arms-control constraints. Adaptation however, has led to some changes in behavior.

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[143] Johnston, "Learning Versus Adaptation," 38-41.

[144] Ibid., 38-44.

[145] Ibid., 46-47,57.

China learned from the United States and the Soviet Union that nuclear weapons enhance national prestige and bargaining power. Additionally, the availability of nuclear weapons can influence the outcome of diplomatic confrontations. China sees participation in the non-proliferation regime as a source of increasing international prestige and a means of presenting itself as a responsible nuclear power to the international community. Participation enhances prestige with major powers by signaling commitment to the values of the regime. It also enhances China's image among Third World countries by giving China an international forum to champion their interests, confirming China's role as leader of the developing world. In this way, China believes membership in the international nuclear non-proliferation regime increases national strength and will help Beijing take its rightful place among the world's great powers.[146]

Other benefits associated with the regime include access to technology and enhanced technical understanding through participation in verification organizations with advanced nations. Verification organizations also give Chinese scientists the opportunity to compare their capabilities to others.[147]

2. Costs

Although the benefits have motivated China to increase participation in the international non-proliferation regime, the costs of participation are real. First, the same inspection organizations that give China access to technical information could also make

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[146] Garret and Glaser, "Chinese Perspectives on Nuclear Arms Control," 47-48, 51, 74, 76; Frieman, "New Members of the Club," 27.

[147] Frieman, "New Members of the Club," 26.

China vulnerable to espionage through intrusive inspections. These inspections may be politically costly in a nationalistic climate by creating a perception of compromised sovereignty. Furthermore, China may be embarrassed to reveal the "backward" state of its factories and research institutes. Second, the non-proliferation regime has increasingly restricted China's nuclear exports, cutting off an important source of hard currency necessary to help fund domestic research and development programs. Third, any agreement that restricts China's research and development could freeze China in a permanent position of nuclear inferiority. Finally, non-proliferation necessarily entails the additional logistical and procedural costs of implementing and enforcing export controls.[148]

As recently as 1997, China lacked the bureaucratic procedures and personnel necessary to negotiate or enforce non-proliferation agreements. China also lacked a training program to fulfill these personnel requirements. Furthermore, unlike the Arms Control and Disarmament Agency (ACDA) in the U.S., China does not have any single government agency that specializes in and is devoted solely to non-proliferation issues. There are approximately 24 organizations that play a role in formulating China's non-proliferation policy. These organizations include the following: academic think tanks such as The Institute of World Economics and Politics and the American Studies Center at Fudan University; the International Organizations and Conferences Department of the Ministry of Foreign Affairs (MFA); certain sections of the People's Liberation Army (PLA) including the General Staff Department, China's Institute of International Strategic Studies, the Institute for Strategic Studies at the National Defense University, the

[148] Ibid., 27.

Academy of Military Sciences, Poly Technologies, and the New Era Corporation; organizations within the weapons research complex, including the China Academy of Engineering and Physics, the Commission of Science Technology and Industry for National Defense (COSTIND), and the China National Nuclear Corporation (CNNC); and other organizations such as the Chinese People's Association for Peace and Disarmament. Despite conflicting interests among these organizations, particularly the PLA and MFA, China has managed to develop a systematic policy.[149]

China's nuclear non-proliferation policy has been influenced by the exposure of their experts to western arms-control concepts. These new concepts and ideas contribute to an ongoing learning process among scientists and officials. Scholarly exchanges between China and the West have played a role in reaching consensus on non-proliferation issues. Few Chinese officials accept the mutual-security concept and do not advocate abandoning self-help.[150] Experts are mindful, however, of the benefits of regime participation. They consider not only the international non-proliferation regime as essential for halting the proliferation of nuclear weapons, but also non-proliferation itself as necessary for national security and the ultimate goal of the complete prohibition of nuclear weapons. This represents a significant change in the thinking of Chinese scientists and officials.[151]

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[149] Ibid., 16-18; Zhu, "The Evolution of China's Non-Proliferation Policy," 46.

[150] Continuation of the theory proposed by Garrett and Glaser, "Chinese Perspectives on Nuclear Arms Control."

[151] Zhu, "The Evolution of China's Non-Proliferation Policy," 45-47; Garret and Glaser, "Chinese Perspectives on Nuclear Arms Control," 49, 51, 76-78.

3. Costs vs. Benefits

China's evolving nuclear non-proliferation policy has emerged from the cost-benefit calculus of Chinese officials. As China's national priorities change, its motivation for participation changes. For China, these priorities have changed from strategic security and economic interests, to national pride and international prestige. China chooses to participate because the political, economic, and security benefits outweigh the costs of joining the regime. In the words of Deputy Assistant Secretary for Non-Proliferation, Robert Einhorn, "China realizes that its own interests are served by non-proliferation."[152]

China views itself as an emerging great power trying to acquire military, economic, and political attributes. The limited security interdependence arrangements in which China participates are a means to this goal. Therefore, it is reasonable to expect China to join those treaties and agreements that offer attractive incentives with minimal costs. China has joined several arrangements based on voluntary disclosure and compliance, with minimal or no verification procedures. In the past 15 years, China has participated in a range of agreements that vary in scope, permitted activities, required activities, and compliance mechanisms. China continues to free-ride on those agreements to which it is not a party. Still, after a history of foreign subjugation, China is reluctant to

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[152] "China's Improving Record in Non-Proliferation: Interview with State Department's Robert Einhorn," *U.S. Information Agency Electronic Journal*, 7 January 1998, *Archived Publications*, CNS Database, MIIS. Available Online: http:cns.miis.edu/db/china/ [21 Nov 1998].

adhere to treaties and is thus faced with a dilemma, as such adherence could represent a compromise in national security.[153]

Is China fulfilling its non-proliferation obligations? The United States has accused China of violating its non-proliferation agreements by contributing to the nuclear weapons programs of Iran, Pakistan, and Algeria. China denies the allegations, insisting that all of its exports are strictly for peaceful purposes. Questions still to be addressed are: What has China exported, to whom China has exported, and do these exports violate China's treaty obligations?

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[153] Frieman, "New Members of the Club," 28; Garret and Glaser, "Chinese Perspectives on Nuclear Arms Control," 74-76.

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IV. NUCLEAR EXPORTS

A. INTRODUCTION

Members of the international non-proliferation regime, particularly the United States, are critical of China's commitment to the values and statutes of the regime. China is suspected of transferring nuclear-weapons-related technology to NNWSs, including Iran, Pakistan, and Algeria.[154] Congressional records describe China as demonstrating a "severe lack of international responsibility" with respect to its nuclear exports.[155] According to an assessment by the Arms Control and Disarmament Agency (ACDA), China is not fully committed to the international non-proliferation regime. This conclusion was based on China's failure to adopt an effective national export-control system. To the ACDA, this proved China's reluctance to embrace completely the norms established by the multilateral non-proliferation regime.[156]

The United States has been the leading plaintiff attacking China's nuclear non-proliferation policies. Much of the information used as evidence by the United States, on China's nuclear exports, however, comes from U.S. intelligence and monitoring agencies, not from the IAEA or other multilateral monitoring groups.[157] The

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[154] Zhu, "The Evolution of China's Non-Proliferation Policy," 22; *The Proliferation of Advanced Weaponry: Technology, Motivations, and Responses*, eds. W. Thomas Wander and Eric H. Arnett (Washington D.C.: American Association for the Advancement of Science, 1992), 123.

[155] *Chinese Nuclear Missiles in Pakistan*, Congressional Record-Senate, June 12, 1996. Available Online: http://www.fas.org/irp/congress/1996_cr/s960612c.htm [05 Oct 98].

[156] *ACDA 1996 Adherence to and Compliance with Arms Control Agreements Report*. Available Online: http://www.acda.gov/reports/complian.htm [25 Jan 1999].

[157] Zhu, "The Evolution of China's Non-Proliferation Policy," 22.

United States has twice imposed economic sanctions on China for violations of the MTCR. However, these sanctions were required by U.S. domestic law, not by MTCR guidelines. The U.S. also refrained from enacting the 1985 Nuclear Cooperation Agreement until March 1998, because China's nuclear-export activities failed to meet the requirements for presidential certification.

In this chapter, an attempt will be made to determine whether China's nuclear exports represent violations of the international nuclear non-proliferation regime, or simply violations of U.S. domestic law and the higher standard of non-proliferation to which the United States holds China. Known Chinese nuclear exports are examined to determine what was sold, to whom, when, and under what safeguard conditions. The exports are outlined in chronological order, beginning with China's first known export of heavy water in 1981.

The outline is divided into four segments. The first segment covers the period from 1981-1984, including exports made prior to China's membership in the IAEA when China had no proliferation restrictions. The second period, 1984-1992, covers exports prior to China's signing of the NPT. During this period, there were no restrictions on Chinese exports of technical knowledge, assistance, data, or dual-use materials and equipment. Exports restricted by the MTCR are covered in the third segment for convenience. The final segment covers Chinese nuclear exports following China's signing of the NPT in 1992 to the present. China's non-proliferation obligations changed relatively rapidly during this latter period. In May 1996, China agreed not to assist unsafeguarded facilities, followed in 1997 by membership in the Zangger Committee and

an agreement to adhere to the original NSG trigger list. Each of these agreements placed additional restrictions on China's nuclear export activities.

B. EXPORTS PRIOR TO 1984

China began exporting nuclear materials in the early 1980s as a result of central government cutbacks in funding for the nuclear industry and a centrally directed, civil reorientation. In 1981, the Chinese central government reduced its allocation to the nuclear industry and cut the state budget for purchasing nuclear products. The central government was focused on funding civil construction projects. Therefore, the Ministry of Nuclear Industry was authorized and even encouraged to sell nuclear goods to generate income to compensate for the loss of state support. The hard currency from nuclear exports was necessary in order to purchase advanced western technology for the improvement of the quality of China's nuclear weapons. The nuclear industry was also directed at this time by the State Council to move away from its national-defense orientation and focus on improving the domestic economy. This was accomplished partly through earning hard currency with nuclear exports.[158]

The first known export of nuclear material was China's sale of heavy water to Argentina in June 1981. Fourteen tons of heavy water were transferred to Argentina via Hong Kong and Paris. At that time, heavy water was defined as a chemical product under jurisdiction of the Ministry of Chemical Industry. The Ministry itself was not authorized to export heavy water directly. It relied on the China National Chemical Industry Import

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[158] Kong, *A Wild Card: Chinese Heavy Water Exports*, CNS Database, MIIS [01 Dec 1998].

and Export Corporation (SINOCHEM), which was directly subordinate to the Ministry of Foreign Trade, and was authorized to look for foreign buyers and conduct sales. China's Nuclear Energy Industry Corporation (CNEIC) was also authorized to export heavy water. Heavy water exported by the CNEIC was treated as a defense commodity and required approval from the Commission on Science, Technology, and Industry for National Defense (COSTIND). Moreover, China's export corporations being new to international trade, were compelled to rely on international brokers to find buyers. Alfred Hempel played a critical role as such a broker in this early, unsafeguarded export of Chinese heavy water.[159]

In 1982, Hempel facilitated the export of an additional four to six tons of unsafeguarded heavy water to Argentina. In 1983, Hempel assisted in the export of more than 50 tons of unsafeguarded heavy water to Argentina via a variety of shipping routes. Twenty tons were shipped via the United Arab Emirates (UAE); 20 tons were shipped via the UAE and the United Kingdom; and more than 10 tons were shipped via the Federal Republic of Germany and Switzerland. Between 1982 and 1983, Hempel reportedly shipped 60 tons of Chinese heavy water to India first through a Swiss subsidiary to Dubai, then on to Bombay. There are unsubstantiated reports of heavy-water exports to Pakistan, South Africa, and a total of over 70 additional tons to India during this same time period.[160]

Prior to 1984, all of China's heavy-water exports were sold without IAEA safeguards. China was not a member of the IAEA at this time. Before becoming an

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[159] Ibid.

[160] Ibid.

IAEA member, China also exported other nuclear materials including uranium hexafluoride to Argentina and South Africa, highly enriched uranium to Argentina, Iraq, and Pakistan, and low-enriched uranium to South Africa, all without IAEA safeguards.[161]

Although China's heavy-water exports were of proliferation concern, they were not violations of any treaties or agreements, as China was not a participant in the international non-proliferation regime. Heavy water, itself had been a specifically restricted export since 1974, when it appeared on the NSG trigger list. China however, did not agree to abide by the restrictions of this list unit 1997.[162]

Following its membership in the IAEA, China began marketing safeguarded heavy water. Since the safeguards affected China's trade, China began offering more competitive prices: averaging 20 percent lower than the prevailing world price.[163] However, China reportedly continued to provide unsafeguarded heavy water in certain bilateral agreements that did not require IAEA involvement.[164]

During this early period in China's nuclear-export history, its alleged assistance to Pakistan's nuclear-weapons program was of particular concern. In 1983, China

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[161] *China's Nuclear Exports and Assistance to South Asia*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nsaspos.htm [18 Jan 99]; *China's Nuclear Exports and Assistance to South America*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nsampos.htm [18 Jan 99]; *China's Nuclear Exports and Assistance to Sub-Saharan Africa*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nafrpos.htm [18 Jan 99]; *China's Nuclear Exports and Assistance to the Middle East*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nmepos.htm [18 Jan 99]; Steven Dolley, *China's Record of Proliferation Misbehavior*, Nuclear Control Institute, September 29, 1997. Available Online: http://www.nci.org/nci/ib92997.htm [22 Aug 1998].

[162] Of note, China refused to sell nuclear weapons to Libya when they were requested in the 1970s.

[163] Kong, *A Wild Card: Chinese Heavy Water Exports*, CNS Database, MIIS [01 Dec 1998]; Gardner, *Nuclear Non-Proliferation: A Primer*.

[164] Exports of nuclear materials of 1000kgs or less do not require IAEA safeguards. Kong, *A Wild Card: Chinese Heavy Water Exports*, CNS Database, MIIS [01 Dec 1998]; Gardner, *Nuclear Non-Proliferation: A Primer*.

reportedly exported enough highly enriched uranium to produce two nuclear weapons. More importantly, China reportedly provided Pakistan with its Chic-4 nuclear-weapon design.[165] Prior to membership in the IAEA, there had been no restrictions on China's nuclear exports; essentially, China was free to assist in the nuclear weapons program of any country it chose.

Although the intent of the IAEA is to promote the peaceful use of nuclear energy and to deter the diversion of nuclear materials to military or weapons uses, membership in the IAEA does not expressly prohibit members from providing "assistance" to NNWS's weapons-development programs. Additionally, IAEA membership requires safeguards on nuclear materials and equipment but not on technical data or assistance. It was not until China signed the NPT in 1992 that "assistance" was specifically prohibited.

C. EXPORTS: 1984-1992 (PRIOR TO NPT)

During this time period, China's non-proliferation obligations required that it report all exports of nuclear material of 1000kg or greater to the IAEA. Additionally, limited-scope safeguards were required on all exports of nuclear equipment or material. However, neither technical knowledge, nor data, nor assistance were restricted. China's export of tritium gas to Pakistan and assistance at the Kahuta lab, as well as China's construction of a 15MW reactor in Algeria during this period are criticized by the U.S. as having contributed to the proliferation of nuclear weapons.

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[165] *China's Nuclear Exports and Assistance to Pakistan*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/npakpos.htm [21 Nov 98]; *China's Non-Proliferation Words vs. China's Nuclear Proliferation Deeds*, Nuclear Control Institute. Available Online: http://www.nci.org/nci/ib12997.htm [22 Aug 98].

1. Pakistan

In 1986, China exported unsafeguarded tritium gas to Pakistan. In that same year, Chinese scientists assisted in the production of weapons-grade uranium at the unsafeguarded Kahuta Lab. China also reportedly allowed Pakistani officials to observe a nuclear weapons test at the Lop Nur nuclear test range. It is possible that Pakistani officials gleaned some information from observing the test, but this was not a non-proliferation violation because no materials or equipment were exported.

China helped design and build a 27kW reactor at the safeguarded Rawalpindi facility in 1989. Two years later, a 300MW pressurized water reactor was exported and built with Chinese assistance at the safeguarded (full-scope) Chasma facility. China also provided Pakistan with a Miniature Neutron Source Reactor (MNSR) under IAEA safeguards (limited-scope) in 1991.[166] Furthermore, China routinely supplies Pakistan with safeguarded (limited-scope) heavy water for use at the safeguarded (full-scope) Kanupp nuclear facility. U.S. intelligence analysis concluded, however, that China is oversupplying the facility by as much as four metric tons per year, facilitating the diversion of heavy water to the nearby, unsafeguarded Khushub facility, which is suspected of being part of Pakistan's nuclear-weapons program.

If China is knowingly oversupplying the Kanupp facility, this constitutes "indirect assistance." Indirect assistance was not a violation of China's treaty agreements during the 1984-1992 time period, but after China signed the NPT in 1993, assistance became a violation. The IAEA has found no evidence that the heavy water at the Khushab reactor

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[166] The MNSR export was safeguarded under the provisions of the nuclear agreement found in IAEA document INFCIRC/393.

is from China. It is possible that this heavy water is a combination of domesticly produced heavy water and heavy water bought on the open market.[167]

2. Algeria

At the time China was signing the 1985 U.S.-China Nuclear Cooperation Agreement, it was also negotiating the construction of a 15MW reactor for Algeria and supplying it with low-enriched uranium fuel and heavy water. The contract to build the reactor was signed in 1983, but the construction did not begin until 1988. The fuel and heavy water were supplied in 1992 after the facility was placed under IAEA safeguards. China also supplied the facility with large hot cells, which can be used to separate plutonium from spent fuel.[168]

3. Iran

From 1984 to 1992, China assisted in the construction, operation, and training of engineers at the safeguarded (full-scope) Isfahan nuclear facility. China provided the facility with a 27kW MNSR in 1985, as well as a heavy-water zero-yield training reactor. Two years later, China exported a calutron to the same facility. In 1991, China agreed to

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[167] *Testimony of Paul Leventhal*, President, Nuclear Control Institute, on China Trade Policy to the Subcommittee on Telecommunications, Trade and Consumer Protection, Committee on Commerce, U.S. House of Representatives, 14 May 1998. Available Online: http://www.nci.org/nci/t51498.htm [22 Aug 98].

[168] *China's Nuclear Exports and Assistance to Algeria*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nalgpos.htm [09 Mar 99]; Daniel Horner, Senior Policy Analysts, *Is Nuclear Cooperation with China in the National Interest?*, Nuclear Control Institute, 24 October 1997. Available Online: http://www.nci.org/nci/dh102497.htm [22 Aug 98].

provide a 20MW research reactor to the Isfahan facility, but this deal was cancelled due to U.S. pressure.[169]

4. Others

During this period, China made numerous other nuclear exports to other countries. Two hundred kilograms of enriched uranium were sold to Brazil in 1984 without IAEA safeguards.[170] Until 1987, China provided its nuclear expertise to North Korea. From 1986 to 1987, China exported natural uranium to France, Finland, and West Germany. It exported safeguarded (limited-scope) enriched uranium to Chile in 1988.[171] It assisted Iraq in building samarium-cobalt ring magnets and provided Iraq with seven tons of the dual-use chemical, lithium-hydride from 1989 to 1990. In 1992, China exported yellow-cake uranium to the U.S. and Japan.[172] China also sold Syria a 30kW MNSR in 1992,[173] but refused Saudi Arabia's request for nuclear warheads.[174]

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[169] *China's Nuclear Exports and Assistance to Iran*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/niranpos.htm [21 Nov 98].

[170] Exports of less than 1000kg of nuclear material do not require IAEA safeguards.

[171] Enriched uranium exported with safeguards under the provisions of the nuclear agreement found in IAEA document INFCIRC/350.

[172] Yellow Cake Uranium does not require IAEA safeguards. Gardner, *Nuclear Non-Proliferation: A Primer*.

[173] MNSR provided with safeguards under the provisions of the nuclear agreement found in IAEA document INFCIRC/408.

[174] *China's Nuclear Exports and Assistance to South America*, CNS Database, MIIS [18 Jan 99]; *China's Nuclear Exports and Assistance to Europe and North America*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/neurpos.htm [18 Jan 99]; *China's Nuclear Exports and Assistance to East Asia*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/neaspos.htm [18 Jan 99]; *China's Nuclear Exports and Assistance to the Middle East*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nmepos.htm [21 Nov 98]; Dolley, *China's Record of Proliferation Misbehavior*, Nuclear Control Institute.

D. MTCR EXPORTS

In June 1991, the Bush administration imposed sanctions against China for transferring M-11 missile-related technology to Pakistan. China, however, did not agree to adhere to the MTCR guidelines until February 1992. Then, China transferred approximately 24 M-11 missiles to Sargodha Airforce Base in Pakistan in December 1992. U.S. sanctions were again imposed in August 1993. In order to have these sanctions lifted, China pledged in October 1994 not to export missiles based on the missiles' inherent capability.[175]

The U.S. National Intelligence Estimate for 1996 reported that China had supplied Pakistan with the blueprints and equipment necessary to build a factory for the production of missiles based on the M-11 design. The State Department stated, however, that it believed China was operating within its assurances regarding the MTCR. The Defense Secretary's April 1996 report stated China remained Pakistan's most important supplier of missile-related technology, but did not state whether China was in violation of its MTCR commitments. In April 1997 moreover, Robert Einhorn, Deputy Assistant Secretary of Defense for Non-Proliferation, testified before Congress that the State Department did not have sufficient evidence to determien whether China had violated its MTCR pledges.

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[175] *China's Compliance with International Arms Control Agreements*, CRS Report for Congress, Hearing Before the Committee on International Relations House of Representatives, 105th Congress, First Session, 7 October 1997; *China Policy Act of 1997*, as introduced in the Senate, S.1164, section 301.

E. EXPORTS: 1993-1997 (POST NPT)

The NPT requires unspecified safeguards on exports of nuclear materials and equipment, and prohibits undefined "assistance" to the nuclear weapons programs of NNWSs. These ambiguous restrictions on nuclear exports left the NPT open to interpretation by its members. It is reasonable to assume that during the period in which China was not a member of the ZAC or NSG, it did not accept the interpretations of the NPT made by these two organizations, and therefore did not consider itself bound by the restrictions imposed by them.

1. Pakistan

After signing the NPT, China continued its nuclear cooperation with Pakistan and Iran, as well as many others. Between 1994 and 1995, the China Nuclear Energy Industry Corporation (CNEIC) sold 5000 ring magnets to the Kahn Research Laboratory at Kahuta. This is an unsafeguarded facility and is suspected of being part of Pakistan's nuclear-weapons program.[176] The sale of these ring magnets was unknown to the central government in China and prompted the United States to pressure China to establish a functional export-control system.[177]

Available Online: http://thomas.loc.gov/cgi-bin/query/D?c105:2/temp/~c105knJeng:e56564.htm [25 Mar 99]; Jones and McDonough, *Tracking Nuclear Proliferation: 1998*, 53.

[176] *China's Nuclear Exports and Assistance to Pakistan*, CNS Database, MIIS [21 Nov 98]; Dolley, *China's Record of Proliferation Misbehavior*, Nuclear Control Institute; *China's Non-Proliferation Words vs. China's Nuclear Proliferation Deeds*, Nuclear Control Institute; Jones and McDonough, *Tracking Nuclear Proliferation: A Guide in Maps and Charts, 1998*.

[177] Chinese Foreign Ministry spokesman Shen Guofang argued that the sale of ring magnets to Pakistan did not represent a central government decision. "China Defends Right to Peaceful Nuclear Exports,"

China assisted Pakistan in building a 40-100MW reactor at the unsafeguarded Khushab facility from 1994 to 1996. It is unclear if this assistance was only technical assistance, or if it included component parts exported from China. China also supplied the Khushab facility with a special industrial furnace in 1996 and assisted in its installation. In the same year, China supplied Chasma with auxiliary equipment including heaters, condensers, and water tanks. Both the industrial furnace and the auxiliary equipment are considered dual-use items. At the time of their export, China had not agreed to the restrictions on the export of the dual-use items found in the ZAC or NSG trigger lists. The following year, China supplied the Chasma-1 power plant with a power-plant computer system. The reactor itself was built by China in 1993.[178] China built the Chasma-2 reactor in 1997. Both Chasma reactors are under IAEA safeguards.[179]

During this same time period, China provided assistance in the construction of the Chasma reprocessing facility, which is not subject to IAEA safeguards. Other unsafeguarded nuclear facilities to which China provided assistance include the Kahuta uranium-enrichment facility and the 50-70MW heavy-water reactor at Khushab.[180] Any technical assistance, or exports of dual-use or component parts to unsafeguarded facilities before May 1996 did not constitute violations of China's nuclear non-proliferation

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Reuters, 8 February 1996; "PRC: Spokesman Denies Nuclear Technology Transfers to Pakistan," *Ta Kung Pao* (Hong Kong) FBIS-CHI-96-028, 9 February 1996; "PRC Spokesman Denies Sensitive Nuclear Exports to Pakistan," *Kyodo* (Tokyo) FBIS-CHI-96-028, 8 February 1996. Available: *China's Nuclear Exports and Assistance to Pakistan-Statements and Developments*, CNS Database, MIIS.

[178] The Chasma-1 reactor was constructed under the provision of the nuclear agreement found in IAEA document INFCIRC/418.

[179] Ibid.

[180] Dolley, *China's Record of Proliferation Misbehavior*, Nuclear Control Institute.

agreements. It was not until May 1996 that China pledged not to provide assistance to unsafeguarded facilities.

2. Iran

After China signed the NPT, it came under pressure from the United States to cease its nuclear cooperation with Iran. From 1992-1993, China agreed to supply two 300MW pressurized water power reactors to be located in southern Iran. The deal was halted in 1995 over difficulties in site selection and financing. Between 1993 and 1995, China supplied calutrons to the unsafeguarded Karaj medical-research center, and provided a complete fusion-research reactor to the nuclear facility in Tehran. China also provided Iran with technical assistance in uranium mining, milling, fuel fabrication, spent-fuel reprocessing, and uranium enrichment. At this time, technical assistance to unsafeguarded facilities was not a violation of China's non-proliferation commitments. In 1994, China agreed to supply Iran with a uranium hexafluoride (UF6) conversion plant at Fasa. China agreed to cease all nuclear cooperation with Iran in 1997, subsequently canceling the construction of the two 300MW power reactors and the uranium hexaflouride conversion plant, in exchange for implementation of the 1985 U.S.-China Nuclear Cooperation Agreement. U.S. intelligence in 1998 discovered, however, that the Chinese Nuclear Energy Industry Corporation was planning to sell hundreds of tons of anhydrous fluoride (AHF), a chemical needed to enrich uranium to weapons grade, to the safeguarded Isfahan Nuclear Research Center.[181] If this sale were being made with the

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[181] *China's Nuclear Exports and Assistance to Iran*, CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/niranpos.htm [21 Nov 98]; Dolley, *China's Record of Proliferation Misbehavior*, Nuclear Control Institute; *China's Non-Proliferation Words vs. China's Nuclear*

knowledge of the central government, it represented a direct violation of China's pledge to cease all nuclear cooperation with Iran.

3. Others

China exported low-enriched uranium to India for use in its safeguarded Tarapur reactors in 1995. In that same year, China exported a 30kW MNSR with enriched-uranium fuel to Ghana.[182] China exported a 30kW MNSR and enriched-uranium fuel to Nigeria the following year.[183] China began negotiations for the export of a nuclear-powered desalinization plant to Morocco in 1997. During this same time period, China exported heavy water to South Korea, yellow-cake uranium to Taiwan, research reactors to Thailand, and 60 tons of enriched uranium to South Africa. All of these exports except the yellow-cake uranium were exported with limited-scope IAEA safeguards.[184]

F. POSSIBLE VIOLATIONS

Since its first nuclear export of heavy water to Argentina in 1981, China has emerged as a major nuclear supplier to the Third World and developing nations. In 1996, the CIA reported that China was the primary source of nuclear-related equipment and

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Proliferation Deeds, Nuclear Control Institute; *Testimony of Paul Leventhal*, Nuclear Control Institute; Horner, *Is Nuclear Cooperation with China in the National Interest?*, Nuclear Control Institute.

[182] MNSR and fuel provided with safeguards under the provisions of the nuclear agreement found in IAEA document INFCIRC/468.

[183] MNSR and fuel provided with safeguards under the provisions of the nuclear agreement found in IAEA document INFCIRC/526.

[184] *China's Nuclear Exports and Assistance to East Asia*, CNS Database, MIIS [18Jan 99]; *China's Nuclear Exports and Assistance to Sub-Sahara Africa*, CNS Database, MIIS [18 Jan 99]; *China's Nuclear Exports and Assistance to the Middle East*, CNS Database, MIIS [18 Jan 99].

technology to Pakistan and Iran. Since China's entry into the international nuclear non-proliferation regime, several of its nuclear exports and nuclear-cooperation agreements have been suspected of contributing to the proliferation of nuclear weapons.

1. Pakistan

China's nuclear exports to Pakistan have caused the most concern in the nuclear non-proliferation regime. The highly enriched uranium exported to Pakistan in 1983 could have been used in the production of nuclear weapons. If so, this would qualify as assistance to the nuclear-weapons program of a NNWS. Although this is of significant proliferation concern, it is not a violation of any treaty or agreement as China was not a member of the IAEA or signatory to any non-proliferation agreement at the time. Several other Chinese exports to Pakistan are not only of proliferation concern, but are also perceived violations of China's nuclear non-proliferation commitments.

Tritium gas is used to achieve fusion in hydrogen bombs and boost the yield of atomic bombs. China exported this material to Pakistan in 1986. At the time, China's only non-proliferation obligations were those defined by its membership in the IAEA. IAEA membership requires limited-scope safeguards on nuclear and special fissionable materials. It does not specifically require safeguards on other non-nuclear materials that could be used in the production of nuclear weapons, such as tritium gas. According to a strict interpretation of the specific requirements of China's IAEA membership, China's export of tritium gas to Pakistan in 1986 was not a violation of China's non-proliferation obligations. However, it can be argued that the export was a violation of the "spirit" of

the IAEA. After all, the IAEA was formed in order to promote the peaceful use of nuclear energy, not the development of nuclear weapons.

The export of 5,000 ring magnets to Pakistan's Kahn Research Laboratory in Kahuta is significant because it was not only viewed as a non-proliferation violation by other non-proliferation regime members, but was also tacitly acknowledged as such by China. Although ring magnets do not themselves comprise any specific category of controlled items, it is possible they are covered under the category of magnetic suspension bearings used in gas centrifuges, depending on the interpretation of the export restrictions.[185] The violation was the lack of limited-scope safeguards, which were required under China's IAEA membership. Since China's central government claimed no knowledge of the transfer, it is possible that a lack of internal export controls explains this possible violation.

Between 1993 and 1997, China assisted in the construction of the 50-70MW heavy-water reactor at the unsafeguarded Khushab facility. No technical assistance that China provided in the construction of the facility could be a violation of China's specified IAEA or NPT obligations. Additionally, the NPT does not specify which component parts of the reactor are subject to limited-scope safeguards. It is the responsibility of each NPT member to interpret its obligations. Conceivably, China did not define the component parts it provided for the construction of this particular reactor as "especially designed for the processing, use, or production of special fissionable material."

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[185] *China's Compliance with International Arms Control Agreements*, CRS Report for Congress, 7 October 1997.

The China Nuclear Energy Industry Corporation provided dual-use equipment to the Khushab facility, consisting of a special industrial furnace and diagnostic equipment. At the time of these exports between 1994-1995, China was not a member of the ZAC or the NSG, which has restrictions on the export of such dual-use items. Members of these two organizations viewed China's exports as violations of the non-proliferation regime. Nevertheless, China's obligations did not include restrictions on dual-use items, and these particular exports were not violations of China's specific non-proliferation commitments. Moreover, the U. S. State Department concluded the transfer did not violate the NPT.[186]

In the 1990's, China also assisted in the construction of the Chasma reprocessing facility and the Kahuta uranium-enrichment facility. The NPT does not specifically prohibit materials or equipment used for reprocessing. If China's assistance took place before it either became a member of the ZAC or agreed to abide by the NSG guidelines, only component parts that were specifically defined as being designed for the use of special fissionable material were violations of China's non-proliferation agreements. The language of the NPT was open to interpretation at that time, and China had not yet accepted the interpretations of the ZAC and NSG. Any technical assistance not involving the export of nuclear materials or equipment cannot be a violation of China's ZAC or NSG agreements.

Although the United States has suspected that all of these exports contributed to Pakistan's nuclear-weapons program, it is difficult to prove that China intentionally provided indirect assistance to the program. China signed four different nuclear-

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[186] Ibid.

cooperation agreements with Pakistan.[187] Each of these nuclear cooperation agreements reportedly contains a guarantee that China's exports will only be used for peaceful purposes. China is not obligated by multilateral non-proliferation commitments to ensure that Pakistan adheres to these agreements. Since China was given assurance that its exports would be used for peaceful purposes, technically under these agreements China was not providing direct assistance to Pakistan's nuclear-weapons program with the materials transferred.

2. Algeria

The United States has alleged that China deliberately assisted Algeria's nuclear weapons program by constructing a 15MW reactor at Ain Oussera. The contract for the facility was signed in 1983, but construction did not begin until 1988. This facility was not declared to the IAEA, and its existence was unknown until 1991, when it was discovered by U.S. intelligence.

Although construction of the facility began after China joined the IAEA, the agreement was concluded prior to membership. If China interpreted its IAEA obligations as applying only to all future nuclear-export agreements, this particular facility would not fall under those guidelines. The IAEA statutes are sufficiently vague as to allow room for interpretation on this issue. Although U.S. officials claimed that the fact that the facility was constructed in secrecy was evidence of its intended use as a part of Algeria's nuclear-

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[187] China's nuclear cooperation agreements with Pakistan include; a technical cooperation agreement, 26 May 1976, a comprehensive agreement on the peaceful use of nuclear power, 15 September 1986, an agreement to supply the Chasma power plant with a 300 MW reactor, November 1989, and an agreement to supply a 300 MW power reactor, 1991. *Nuclear Cooperation Agreements*. CNS Database, MIIS. Available Online: http://cns.miis.edu/db/china/nca.htm [03 Mar 99].

weapons program, this is not conclusive proof that China directly assisted a NNWS in developing nuclear weapons. The nuclear-cooperation agreement between Algeria and China called for the cooperation in peaceful uses of nuclear energy.[188]

3. Iran

Finally, China has allegedly violated its non-proliferation agreements with its nuclear exports to Iran. China exported a calutron, which is used to enrich uranium to weapons grade, to the unsafeguarded medical-research facility at Karaj. Because the calutron was transferred to a medical-research facility, China argues the export was obviously for peaceful purposes. Additionally, the transfer occurred prior to China's pledge not to assist any unsafeguarded facilities. As long as the calutron was exported under limited-scope safeguards, China's non-proliferation obligations were met.

The Chinese Nuclear Energy Industry Corporation's intention to export hundreds of tons of anhydrous hydrogen fluoride, a chemical needed to enrich uranium, is difficult to justify. At the time of the intended transfer in 1998, China had agreed to cease all nuclear assistance to Iran. This is perhaps the most arguable violation of China's nuclear cooperation agreements.

G. CONCLUSION

China has consistently maintained that it has not violated any international non-proliferation agreements. Since China's accession to the NPT, however, significant concerns persist about its compliance with the NPT and other non-proliferation

[188] Ibid.

agreements. This thesis does not suggest that China's nuclear-export activities are not a proliferation concern; however, many of the alleged violations, strictly interpreted are not "letter-of-the-law" violations of China's nuclear non-proliferation obligations. At best, they are perceived violations, and the peaceful purposes of China's export activities are questionable. At worst, they represent direct, knowledgeable assistance to the nuclear-weapons development programs of NNWSs, within a liberally interpreted framework of China's non-proliferation agreements. The extent of China's transgressions depends on the interpretation of the treaties and agreements to which China is a party.

The ACDA, which monitors compliance with arms-control and non-proliferation agreements, has absolved China in its annual *Adherence to and Compliance with Arms Control Agreements Reports*. The ACDA's 1995 report stated that although China continued to provide nuclear assistance to Iran and Algeria in 1995, its assistance appeared consistent with China's NPT obligations. In 1996, the ACDA reported that although questions remained about contacts between Chinese entities and elements associated with Pakistan's nuclear-weapons program, there was insufficient information to reach a judgment of non-compliance with the NPT.

Additionally, the available information did not provide a basis for concluding China's export activities were inconsistent with its May 1996 pledge. The ACDA's 1997 report stated that China's cooperation on individual cases and its continued compliance with its May 1996 pledge demonstrated China's commitment to its non-proliferation obligations.[189] Leonard Spector, a Senior Associate for the Carnegie Endowment for

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[189] *ACDA 1995, 1996, 1997 Adherence to and Compliance with Arms Control Agreements Reports.* Available Online: http://www.acda.gov/reports/complian.htm [25 Jan 1999].

International Peace, testified before the House International Relations Committee that China had adhered to the restrictions concerning IAEA safeguards with its exports to Iran.[190] Robert Einhorn, Deputy Assistant Secretary of Defense for Non-Proliferation testified before the U.S. Senate that there was no significant proof that China had violated its nuclear non-proliferation agreements.[191]

China has proven adept at finding the loopholes and weak points of the non-proliferation regime. It is this skill that is partially responsible for the tightening of the regime and increasing specification of members' obligations. The formation of the ZAC was the result of the NPT being too ambiguous to be properly enforced. China's perceived violations have also demonstrated a need for appropriate domestic export controls among the regime's members. With prompting from the United States, China has endeavored to overhaul its export control system.

The United States has argued that even if Chinese transfers are in compliance with the NPT and its other non-proliferation agreements, strictly interpreted, they contributed to Pakistan's and Iran's suspected nuclear-weapons programs by transferring nuclear technology and knowledge under a civilian cover. Also, U.S. policy has been based on the opinion that even if Chinese nuclear transfers to Iran and Pakistan are legal, they are harmful to U.S. and Chinese national interests of peace and stability.[192]

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[190] Chinese Assistance to Iran's Weapons of Mass Destruction and Missile Programs, testimony by Leonard S. Spector, Senior Associate Carnegie Endowment for International Peace, before the House International Relations Committee, September 12, 1996. Available Online: http://ceip.org/programs/npp/nptest/htm [26 Jan 99].

[191] Jones and McDonough, *Tracking Nuclear Proliferation: 1998; China's Compliance with International Arms Control Agreements*, CRS Report for Congress, October 7, 1997.

[192] *China's Compliance with International Arms Control Agreements*, CRS Report for Congress, 7 October 1997.

If this is true, why does China continue to export nuclear technology and equipment to these countries? The answer to this question lies in China's motivational profile, which is based on China's national interests and export motivations. Perhaps a reassessment of China's national priorities is necessary; regardless, further study is required in order to predict China's future export behavior.

V. CONCLUSIONS

A. ADAPTIVE PARTICIPATION

China has clearly stated its current nuclear non-proliferation policy: "China does not advocate, encourage, or engage in nuclear proliferation, nor does it assist other countries in the development of nuclear weapons." The evolution of this policy has been a series of adaptive changes intended to protect China's national interests. China's ultimate objective of becoming a major power has not changed. China has merely redefined the subordinate goals necessary for attaining its ultimate objective. Nuclear weapons alone did not provide the status China sought. China now seeks economic strength, political viability, and continued security by balancing participation in the international nuclear non-proliferation regime with the exportation of nuclear material.

B. COSTS VS. BENEFITS

The process used to balance regime participation and nuclear exports is a type of cost-benefit calculus. In this process, export incentives and disincentives are weighed and compared when nuclear-export decisions are made. Thirteen incentives and three disincentives have been identified in China's nuclear export decision-making process. These incentives and disincentives fall into three categories: international prestige, military/security, and domestic/political. The relative influences of these export motivations on decision-making are not static. The influence of each incentive and disincentive is dependent on China's national priorities as influenced by international and

domestic conditions. As priorities and conditions change, so do the combination of motivations and their relative influence known as a motivational profile. Conceivably, each of China's nuclear exports could be motivated by a distinct motivational profile, depending on the rate of change in China's national priorities and international and domestic conditions. The end of the Cold War was a significant change in the international environment influencing China's cost-benefit calculus. China's economic success has also changed its national priorities. The complex nuclear-export decision-making process is further complicated by the controversy concerning dual-use materials, dual-use technology, and the peaceful use of nuclear energy.

C. GUILTY OF PROLIFERATION?

China has repeatedly exercised its sovereign right to possess and export nuclear materials and technology. Scrutiny of China's exports shows that it has fulfilled the obligations under a strict "letter-of-the-law" interpretation of its non-proliferation commitments. By exporting to nations with assumed nuclear ambitions, however, China has violated the spirit of the regime that was intended to prevent the proliferation of nuclear weapons. At best, China's nuclear-export activities are "proliferation-questionable". At worst, China's nuclear exports are made with the knowledgeable intent of supplying indirect assistance to nuclear-weapons development programs. China's nuclear-export activity is evidence that China has not internalized the values of the non-proliferation regime, and does not place the goals of the regime above its own national interests. This evidence validates the hypothesis that China's nuclear-export decision-

making and policy evolution are an adaptive process that is a result of internal and external constraints and pressures.

D. REGIME AND U.S. POLICY IMPLICATIONS

One of the constraints influencing China's non-proliferation policy is the pressure to abide by emerging non-proliferation norms. Just as China's national priorities and the international environment are not static, the nature of the non-proliferation regime is also changing. The rules of acceptable nuclear-export behavior have become more restrictive, as regulations have proved ineffective. As a major nuclear supplier, China's and its "proliferation-questionable" exports have influenced the regime, which has in turn, developed stricter guidelines and made China a victim of "shifting goalposts." The changing nature of the regime has placed greater expectations on China to abide by the norms and not just its strictly interpreted obligations. China's nuclear-export activities have influenced the nature of the regime, which in turn has influenced China's non-proliferation policy acting as a disincentive, which then influenced China's nuclear export decision-making.

The United States has been the chief plaintiff concerning China's nuclear-export activities. In the past, U.S. attempts to alter China's nuclear-export activities were successful when the targeted changes were congruent with China's national priorities. For the United States to influence China's future nuclear-export activities, it must first understand China's national priorities and determine the corresponding export motivations that are currently influencing China's decision-making process. The United

States can then work to change conditions, which will shift the balance of incentives and disincentives, thereby changing the outcome of China's cost-benefit calculus.

This thesis does not attempt to predict future Chinese nuclear-exports behavior. Rather, it proposes that a reassessment of China's perceived national priorities is necessary and that corresponding U.S. foreign policy change may be in order. Further study is required to determine China's future national interests and motivational profile.

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